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A MANAGEMENT ASSISTANCE STUDY FOR THE ENVIRONMENTAL PROTECTION BRANCH OF THE MICHIGAN DEPARTMENT OF NATURAL RESOURCES

David Ackerman, et al

Stanford Research Institute

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December 1974

A MANAGEMENT ASSISTANCE STUDY
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THE ENVIRONMENTAL PROTECTION BRANCH
OF [redacted]
THE MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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Prepard by Standford Research Institute for:
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CHICAGO, ILLINOIS 60604

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN STREET
CHICAGO, ILLINOIS 60604

DEC 31 1974

Mr. Ralph Purdy
Deputy Director
for Environmental Protection
Michigan Department of Natural Resources
Steven T. Mason Building
Lansing, Michigan 48926

Dear Mr. Purdy:

The enclosed final report entitled "A Management Assistance Study For The Environmental Protection Branch of the Michigan Department of Natural Resources", has been prepared by the Stanford Research Institute. It is a source of satisfaction to us to have been in the position to provide this form of assistance to you and your staff.

The study provided an opportunity for your staff managers to do some introspective examination of their functional relationships as they relate to their program objectives, activities and interface with other public and private organizations. I believe that the report provides thoughtful perspective on concepts of inter-relating our roles in such a way as to be responsive to the mandates given us as administrators of the environmental protection programs by the citizens of Michigan. Society's recognition of the long overdue need to plan for effective use and management of our natural resources must be addressed by us in a timely and responsive manner that will assure the public that we are taking a comprehensive and balanced approach to the successful resolution of abating pollution, and protecting the quality of our environment where it is yet unspoiled and where pollution has been abated.

The report offers rationale and an approach to manage human resources in accomplishment of the Department's environmental protection objectives. In the final analysis of determining how and when to implement acceptable recommendations resulting from a management assistance study, a certain amount of pragmatic judgement must be applied.

DEC 31 1974

We recognize this and hope that to the extent appropriate, implementation activities will be pursued in the near future.

We wish you continued success in building and managing an effective effort to accomplish the environmental quality goals of the State of Michigan.

Sincerely,

Francis T. Mayo

Francis T. Mayo
Regional Administrator

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I INTRODUCTION

In June 1973, a management assistance study oriented to the responsibilities and needs for organizational accountability of the newly established Environmental Protection Branch within Michigan's Department of Natural Resources was funded by the United States Environmental Protection Agency through its Region V offices. This study was a joint effort performed by the State of Michigan and Stanford Research Institute.

The impetus for this study had its source in the executive order issued by Governor Milliken on January 11, 1973, which reorganized the environmental protection functions of the State government by consolidating these activities in a single branch within the Department of Natural Resources. An additional executive order issued on March 13, 1973 modified the earlier order and clarified certain provisions. The Governor's actions, concurred in by the legislature, became effective April 1, 1973. As a result of these actions, the augmented Department of Natural Resources now consisted of two major branches, the Natural Resources Branch and the Environmental Protection Branch which included activities pertaining to air, water, and solid waste; both branches now reported directly to the Director of the Department of Natural Resources. The Governor also established within this enlarged department the Office of Land Use Planning which contained the State's land use planning and control activities. This function formerly operated within the Executive Office.

When this consolidation occurred, Mr. Francis Mayo, Regional Administrator of EPA Region V, extended an offer to the State of Michigan to fund a management assistance study for the newly created Environmental Protection Branch. Mr. A. Gene Gazlay, Director of the Department of Natural Resources, agreed that such a study offered a valuable opportunity for examining the implications of the State's coordinated response to environmental problems and recommended to its Commissions that the study be performed. In July 1973, Stanford Research Institute, a nonprofit contract research organization, was selected to perform the study.

The main thrust of this research effort was to implement the objectives of the Governor's executive order by providing the management of the enlarged Department of Natural Resources with the most efficient and effective management and policy system for achieving the State's environmental protection goals. The specific objectives of this study were to:

(1) Identify, analyze, and define the environmental functional relationships that exist within the Michigan Department of Natural Resources as they relate to intrastate governmental agencies, interstate and international agencies and commissions, and the Federal government.

(2) Examine the Department's interrelationships with the public and private sectors of the community with respect to the concerns and expectations that these bodies have regarding environmental policies and actions that affect their interest positions.

(3) Analyze and define the interfaces that exist within the Department between the Natural Resources Branch and the Environmental Protection Branch with special emphasis on how policy decisions that occur within these branches affect the objectives and operations of each.

(4) Review the Department's operations that are required to accomplish the State's environmental protection goals and identify opportunities for upgrading human resource capabilities in the Department.

(5) Provide consulting services to the Department with the aim of identifying opportunities for improving the effectiveness and efficiency of operations in the functional and supporting activities of the Environmental Protection Branch.

The scope of the SRI study did not provide for an assessment of the overall functions of the Department of Natural Resources despite recognition by all parties involved in the study of the interdependency of the relationship between the activities in both branches, especially those functions affecting Departmental policies and objectives. Although it would have been desirable to include in the study both Natural Resources Branch and department-wide functions, such as land use responsibilities, it was not feasible to do so because of the substantial costs and time constraints involved; it was decided, however, that the impact of the Environmental Protection Branch's policy and operations on the activities of the Natural Resources Branch could be addressed only by means of an analysis of the interfacing transactions following a comprehensive review of the responsibilities and function of the Natural Resources Branch.

The results of the present study suggest that the findings and recommendations that emerged deal adequately with the interfaces between the two branches; it is quite possible, however, that immediate implementation of organizational alternatives for internal restructuring of the Environmental Protection Branch could have such unwanted effects as (1) unanticipated influences on some activities and programs in the Natural Resources Branch, (2) establishing functions and activities at the branch level that might be more appropriately placed at departmental decision-making levels, and (3) premature foreclosure of opportunities open to the Department for taking advantage of interdependent trade-offs now available because natural resources management, environmental protection activities, and the land use function are located within the same State agency.

Because the implications of this study extend beyond the Environmental Protection Branch to the entire Department, it is hoped that in the future sufficient resources might be found to fund a study that would expand the scope of this present effort to include a full spectrum of interrelated issues. An augmented study of this kind would provide an opportunity to develop an integrated organizational concept for unifying natural resources management, environmental protection, and the emerging issues of land use planning and control. This fortunate combination of factors in the State of Michigan presents a unique opportunity to address these issues within the context of a single organizational setting.

The basic strategy of the SRI project team in performing this study was to utilize participative methods where possible. Groups and individuals from the different functional units worked closely with the SRI project team to identify organizational problems and input ideas and suggestions for their solution. SRI attempted to tap as broad a spectrum of representative viewpoints as possible with the expectation that this approach would stimulate intensive discussion of the major issues and lead toward a reasonable consensus by the time the study was completed. This process generated much productive interaction and communication between the membership of the Department and the SRI project team. Many ideas and suggestions that emerged from these discussions were incorporated in the findings and recommendations developed in this study.

An additional objective of the SRI team was to introduce into the diagnostic discussions new ideas and perspectives for viewing departmental work processes so as to encourage a rethinking of present modes of performing departmental activities and responsibilities. It was also hoped that by combining the knowledge, experience, and insights of the SRI project team with those of the membership a new concept of organizational operations would emerge that incorporated these characteristics:

- Openness of communications within the Department.
- Broadened group perceptions.

- Recognition of the capabilities and resources within the total organization.
- Continuing examination of alternative methods for improving the quality and quantity of services.
- Sensitivity to new service applications.
- Awareness of cost/benefit implications for different work methods and processes.
- Development of a group capacity to plan for and cope with the impacts of change.

SRI also worked within a system context to merge the appropriate technical perspectives and disciplines required to cope with the complexities of departmental operations. This approach required a systematic assessment of all functional elements within the Department including consideration of available technology, structural arrangements, resources, and the patterning of relationships used in performing the various tasks. In performing this study, SRI focused its efforts on understanding the systemic bases of organizational dysfunction to avoid becoming enmeshed in the more readily perceived surface symptoms. Emphasis was, therefore, placed on those processes that link organizational elements into a totality for accomplishing the overall purposes. SRI used behavioral science methods as well as the more traditional forms of analysis to understand the environmental pressures and task demands facing the organization and the individuals comprising it.

This report summarizes the study team's effort to assist the State of Michigan to improve the efficiency of those environmental activities recently transferred to the Department of Natural Resources under the terms of the executive order issued by Governor Milliken. Included is a review of present operations and management functions; assessment of problems related to work flow, policy generation and implementation, priorities, and methods and procedures related to work processes, staffing patterns, and other related issues; review of technical operations and supporting information systems; the Branch's pattern of intergovernmental relationships; and an analysis of the needs, interests, and problems associated with stakeholder groups.

The SRI project team wishes to express its appreciation for the considerable help and support that it received from Department of Natural Resources personnel at all levels. Mr. A. Gene Gazlay, Director, and his staff were extremely cooperative and helpful in providing needed support throughout the study. To Mr. Ralph W. Purdy, Deputy Director of the Environmental Protection Branch, the team owes special thanks for his

patience, guidance, and generosity in making available information, technical expertise, and staff support. The same can be said for Dr. David H. Jenkins, Deputy Director, Natural Resources Branch, whose assistance greatly facilitated the SRI effort. Above all, the SRI project team owes a debt of gratitude to the managerial, technical, and clerical personnel within the Department who provided much valuable information and services, without which this research could not have been performed.

The study was sponsored by the Midwest Regional Office of the United States Environmental Protection Agency under the direction of Mr. Francis T. Mayo, Regional Administrator. Technical coordination from this office and project administration was provided by Mr. James A. Marth, Director of State and Interstate Program.

II EXECUTIVE SUMMARY

Michigan has long been recognized for its outstanding environmental protection programs as well as its responsiveness to national environmental policies and goals. The excellence of its programs has not been emphasized throughout this report because the intent of the study has been to identify opportunities for updating operational effectiveness in light of recent changes in Federal legislation. Therefore, Stanford Research Institute, with the collaboration of the State of Michigan and the U.S. Environmental Protection Agency, completed a management assistance study of the newly established Environmental Protection Branch of the Department of Natural Resources.

The main thrust of this effort was to assist the Department to enhance the effectiveness and efficiency of its environmental activities including those recently transferred to the Department under the terms of Governor Milliken's executive order. Included within the scope of the SRI program of technical assistance was a review of present operations and management functions; identification of problems related to work flow, policy generation and implementation, priority setting, and staffing patterns; review of technical operations and supporting information systems; Branch intergovernmental relationships; and analysis of the needs, interests, and problems associated with stakeholder groups. The scope of the study did not include a full assessment of the overall functions of the other branch or programs of the Department of Natural Resources because of the significant costs and time constraints involved; the impact of the Environmental Protection Branch's policy and operations on other departmental functions was studied by analyzing the interfacing transactions. Finally, a series of recommendations designed to enhance the effectiveness and efficiency of the Branch's consolidated operations were developed by the SRI project team. Some of these recommendations were implemented during the course of the study.

The following major findings and recommendations emerged from the study by the SRI project team.

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Management Operations Findings

The review of current management activities identified the following areas of operational dysfunction:

- Compartmentalization causing problems in coordination and internal communications.
- Inappropriate match between work programs and resources.
- Absence of a soundly based systems analysis capability for dealing with problems related to information processing, work flow, paper-work processes, and integrated filing systems.
- Absence of sophisticated management techniques in such areas as work planning, management by objectives, performance evaluation, and management controls.
- A reactive rather than anticipative operating posture within the Branch.
- Absence of a formal system for generating and organizing policies in a structured, documented format.
- Management control systems that require further updating.
- Absence of a formal system of procedures documentation.
- Absence of a methodology for systematically establishing priorities.
- Need for better utilization of performance appraisal as a management tool.
- Planning activities are primarily oriented to the preparation of environmental compliance plans and programs required by law; systematic strategic and operational planning is underemphasized and not part of the formal processes.
- Significant improvement can be made in handling information related to management and technical operations; data processing support also needs strengthening.

Management Review Recommendations

- Establish a centralized planning function that would include provisions for (a) strategic planning, (b) operational planning, and (c) preparation of state environmental programs required by law (see page 80).
- Assign to the planning function responsibility for defining and developing objectives, determining alternative means for accomplishing these objectives, providing mechanisms for changing or modifying objectives, and communicating these objectives to appropriate levels in the organization (see page 81).
- Establish an organizational unit that centralizes all information processing activities performed in the Branch and that would include provisions for developing and managing (a) a management data system for augmenting management decision making and (b) a technical data system to support the technical functions involved in managing environmental quality (see page 83).

Technical Operations Findings

SRI's review of the Branch's technical operations resulted in delineating the following problem areas:

- A formal, integrated process for reviewing permit applications in terms of intermedia impacts is not available; nor has permit processing been stabilized against a computational model or an organized data base.
- Surveillance operations can be improved, especially in such areas as follow-up to permit authorization and systematic intelligence to detect unauthorized actions.
- Monitoring is approached more from an enforcement perspective than from an environmental point of view. Coverage of parameters that define potential demand for uses and describe extant uses on public health, welfare, and other relevant socioeconomic characteristics are in need of improvement.
- The press of everyday enforcement work usually results in an underemphasis on special studies related to procedure development or evaluation of unique environmental problems.

- New approaches to public participation are needed.
- More formal educational programs are needed to keep Branch professional and technical personnel up to date in their specialty areas.

Technical Operations Recommendations

- Consolidate the separate permitting processes in the Branch into a centralized system that would allow the paperwork associated with these applications to be handled in a logical, efficient manner (see page 86).
- Establish a schedule of surveillance activities as part of the permitting process (see page 86).
- Distinguish institutionally the purpose of monitoring for enforcement from the purpose of monitoring for environmental resource management (see page 87).
- Use special studies to (1) support state environmental quality goals and objectives, (2) acquire new technology and perspective, (3) continue to build a national reputation of scientific and technical excellence, and (4) build credibility with the State's constituents (see page 87).
- Give the public participation function an organizational focus (see page 88).
- Implement a program of technology acquisition for all the specialists of the Branch's technology base (see page 88).

Manpower and Personnel Findings

A review of manpower programs related to Branch operations revealed the following areas of concern:

- There is no systematic process for determining future manpower requirements, to assess the capability of existing manpower resources to meet these requirements, or to establish a framework for developing action programs to solve existing or anticipated manpower problems.

- An employee information system which provides ready access to data about employees' personal and experiential characteristics is not available.
- A formal personnel training and development program designed to meet Branch needs for technical, supervisory, and managerial personnel does not exist. There is a need to establish a formal career development program.
- The employment process is too lengthy and cumbersome; adjustments are necessary to reduce the time span for filling vacancies.
- Civil Service wage administration policies do not provide sufficient incentives for encouraging the exceptional employee. Present policies are geared to the average performer.

Manpower and Personnel Recommendations

- Establish a manpower planning system that provides for (a) an employment function, (b) formal training and development programs for inside staff as well as local agency personnel, (c) effective manpower utilization programs, and (d) a methodology for achieving efficient manpower resource allocations (see page 91).
- Develop a performance review system that goes beyond meeting just the minimum standards of the Civil Service Commission (see page 92).
- Develop an employee information system to provide the necessary data to facilitate the workings of the management process. This system would also augment vertical and horizontal communications within the organization (see page 92).

Intergovernmental Process Findings

The findings reported below are based on the emerging needs for intergovernmental process program elements both within the State and between the State and Federal government.

- There is no single, identifiable source within the Branch to which a local government authority can go to determine the status of actions affecting his jurisdiction. An action, once started, must be pursued through the agency on a personal contact basis.

- Different actions concerning the same local jurisdiction are handled by different sections and personnel in the Branch. Coordination is a matter of personal initiative, and the lack of a formal mechanism for achieving appropriate linkage leads to tensions and misunderstandings between Branch field staff, headquarters staff, and local authorities.

- Responsibility for developing new State programs in response to State legislation is divided and scattered. Therefore, the intergovernmental aspects of such programs lack systematic development.

- There are 119 points of contact within the Branch which have 198 points of contact with staff in 12 agencies, departments, bureaus, and commissions in the Federal government; these contacts involve at least 31 categories of program activities There is no centralized activity within the Branch responsible for coordinating these intergovernmental activities.

- The Branch lacks a systematic data base which can determine the impact of proposed Federal statutory and regulatory actions on state interests; nor is there an informed methodology for conducting such assessments.

- Federal statutes, rules, and regulations require socioeconomic projections, cost-benefit determinations, demographic projections, and impact analysis in connection with the Branch's obligations in meeting specific program requirements. Many of these requirements must be met for regional or local jurisdictions. The Branch has neither the organizational capabilities for carrying out these requirements nor the means to negotiate the specific determinations, projections, and analyses with the local governmental units in the State.

Intergovernmental Process Recommendations

- Establish an organizational component within the Environmental Protection Branch to be responsible for intergovernmental affairs. Assign to this component the means for developing and managing all intergovernmental programs for the Branch (see page 95).

Stakeholder Processes Findings

The findings presented below are based upon an analysis of SRI interviews with members of the Environmental Protection Branch and representatives of interest groups throughout the State of Michigan as well as the experience of the SRI team members in this growing area of concern.

- Little formal recognition of stakeholder interests exists within the Branch. Consequently, there is no management provision for objective assessment of the various interest positions nor is there any systematic means for relating such claims to ongoing policies and programs or determining the areas of consensus and difference between the groups.
- The Branch has not developed a systematic methodology for determining the critical issues and actions of interest to the various stakeholder groups and disseminating pertinent information to the public and the interested groups. Communication channels that do exist are fragmented and dispersed among the various components and individuals in the Branch.
- The Branch has not developed an informed constituency of stakeholder interests in regard to emerging or pending issues that contain potential for public controversy. Stakeholder positions are apt to develop fortuitously or depend upon individual initiative to develop information and expertise relevant to the issues. Effective work in this area can facilitate the formation of public consensus on critical issues and thereby reduce abrasive and disruptive controversy.
- On some issues, the staff has adopted an adversary posture with respect to positions of some stakeholder groups. This often leads to "win-lose" situations on specific issues. Few of the Branch's regulatory actions or other decisions can be reduced to such clear-cut alternatives when viewed in the context of larger environmental goals set for the Branch and its Commissions by the Legislature. These hard decisions are seldom cast in the more reasonable and tractable framework of broader goals and objectives. The adversary role carries with it the unfortunate tendency to reduce future opportunities for constructive stakeholder relations.

- The Branch does not systematically develop and maintain an integrated data base related to stakeholder groups. Information pertaining to stakeholder interests is maintained by particular individuals or components in the Branch.

Stakeholder Processes Recommendations

- Establish within the intergovernmental component a group whose specific responsibilities and duties are related to stakeholder interests in all of the Branch's programs. Delegate to this group the responsibility for coordinating all presently required public participation activities for the Branch (see page 99).

III ANALYSIS OF PRESENT ORGANIZATION

In July and August of 1973 the SRI project team made several visits to Lansing for the purpose of conducting an on-site assessment of the operations of the Environmental Protection Branch of the Department of Natural Resources. During this period all key management and technical personnel in the Branch were interviewed in depth. Communications were also established with public officials in relevant State and municipal agencies, regional planning bodies, and the Midwest Region Office of the U.S. Environmental Protection Agency and with individuals and organizations throughout the State representing diverse interest positions in regard to policies, programs, and activities related to environmental protection. In addition to the general goal of conducting an evaluation of the current and future operational capability of the Branch, the specific objectives of this effort were to:

(1) Develop an understanding of the responsibilities and operations of the organization.

(2) Assess the management processes existing in the organization.

(3) Identify the process of policy generation, policy selection, and policy implementation with emphasis on the mechanisms for instituting changes, updating, and measuring effects.

(4) Identify the management styles employed at the different organizational levels including leadership methods and control processes.

(5) Identify operating problems relating to work flow, staffing patterns, work priorities, methods and procedures related to work processes, redundancy, and other relevant issues.

Present Organizations

The Environmental Protection Branch under the direction of a deputy director is one of two major functional components which comprise the Natural Resources Department, the other being the Natural Resources Branch also managed by a deputy director. The Natural Resources Department, in addition to the two main branches, consists of the following organizational units: the Administrative Bureau, Office of Land Use Planning, Council of Tourism, an executive assistant for policy coordination, and an executive assistant for public relations, all reporting to the Director's Office. These relationships are given in more detail in Figure 1.

Overall policy guidance for the Department is provided by the Natural Resources Commission whose designated executive officer is Director of the Department.

Policy guidance for the Water Management Bureau is provided by the Water Resources Commission. The membership of the Water Resources Commission is composed of the following:

- The Director of the Natural Resources Department
- The Director of the Public Health Department
- The Director of the Agriculture Department
- The Director of the Highway Department
- An appointed member representing conservation groups
- An appointed member representing municipalities
- An appointed member representing industry.

The Director of the above-named State agencies may delegate their representation on the Commission by naming a surrogate from inside their department. The Director of the Natural Resources Department is currently represented on the Commission by the Chief of the Resources Bureau of the Natural Resources Branch. The Deputy Director responsible for the Environmental Protection has been designated Executive Secretary of the Water Resources Commission and his Bureau Chief for Water Management serves as the Assistant Executive Secretary. These individuals, together with the Director's representative, all serve to represent the Water Resources Commission with the Natural Resources Commission.

In addition to the formal Commission relationships outlined above, various staff members of the Water Management Bureau are selected to make periodic reports to the Natural Resources Commission to keep it informed on current activities and programs. From time to time, the Commission will request the services of staff members to perform specific assignments or support duties.

The Air Pollution Commission provides policy direction for all activities now subsumed under the Division of Air Pollution Control. Membership on this commission includes the following:

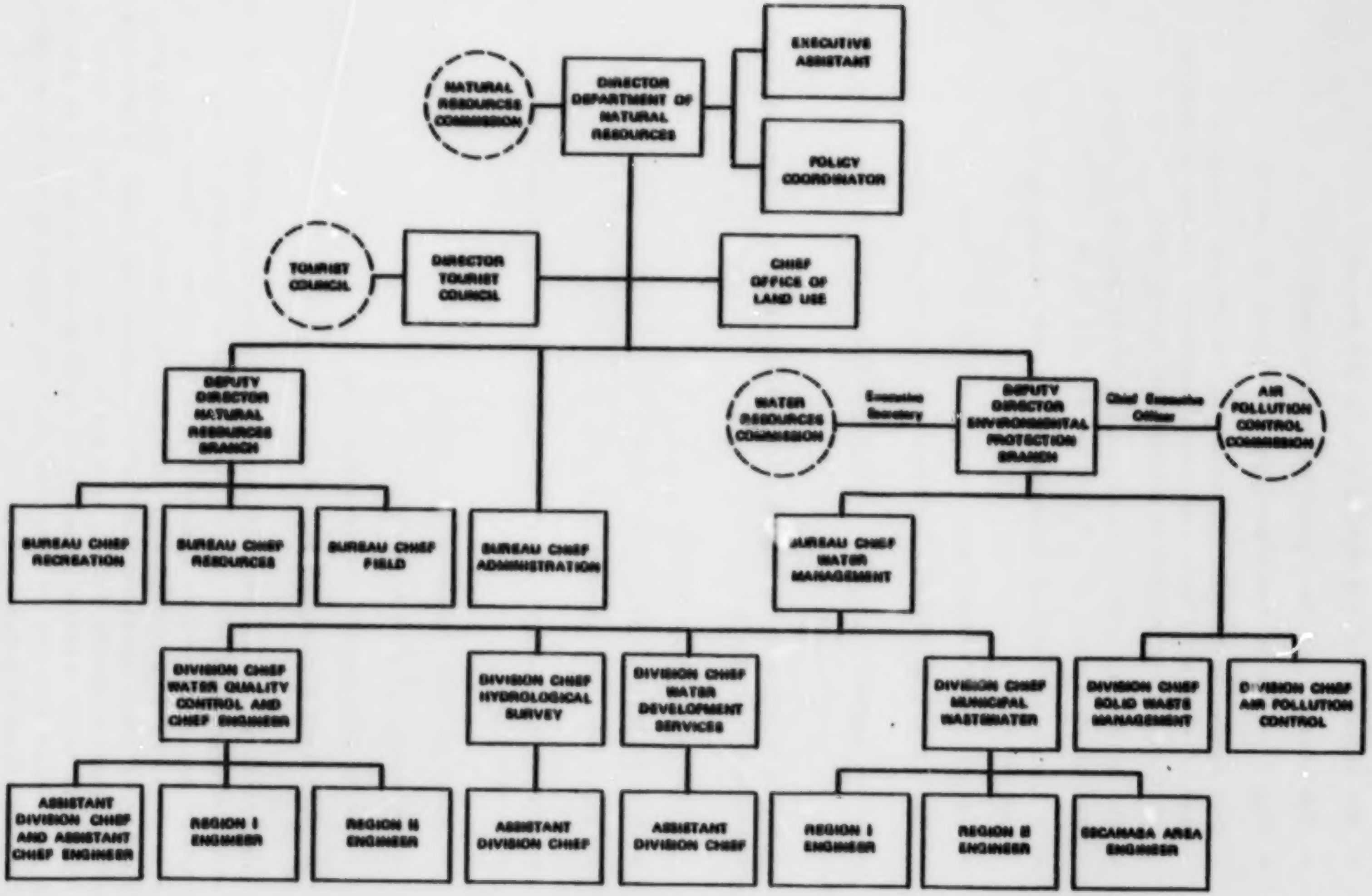
NATURAL RESOURCES COMMISSION
DIRECTOR DEPARTMENT OF NATURAL RESOURCES
EXECUTIVE ASSISTANT
POLICY COORDINATOR
TOURIST COUNCIL
DIRECTOR TOURIST COUNCIL
CHIEF OFFICE OF LAND USE
DEPUTY DIRECTOR NATURAL RESOURCES BRANCH
WATER RESOURCES COMMISSION
Executive Secretary
DEPUTY DIRECTOR ENVIRONMENTAL PROTECTION BRANCH
Chief Executive Officer
AIR POLLUTION CONTROL COMMISSION
BUREAU CHIEF RECREATION
BUREAU CHIEF RESOURCES
BUREAU CHIEF FIELD
BUREAU CHIEF ADMINISTRATION
BUREAU CHIEF WATER MANAGEMENT
DIVISION CHIEF WATER QUALITY CONTROL AND CHIEF ENGINEER
DIVISION CHIEF HYDROLOGICAL SURVEY
DIVISION CHIEF WATER DEVELOPMENT SERVICES
DIVISION CHIEF MUNICIPAL WASTEWATER
DIVISION CHIEF SOLID WASTE MANAGEMENT
DIVISION CHIEF AIR POLLUTION CONTROL
ASSISTANT DIVISION CHIEF AND ASSISTANT CHIEF ENGINEER
REGION I ENGINEER
REGION II ENGINEER
ASSISTANT DIVISION CHIEF
ASSISTANT DIVISION CHIEF
REGION I ENGINEER
REGION II ENGINEER
ESCANABA AREA ENGINEER

FIGURE 1 THE PRESENT ORGANIZATION

- The Director of the Public Health Department.
- The Director of the Agriculture Department.
- The Director of the Department of Natural Resources.
- Two appointed members representing industrial management, one of whom must be a registered engineer trained in matters related to air pollution management and control.
- Two appointed members representing local governing bodies, one of whom must be a full-time air pollution officer.
- A Doctor of Medicine experienced in the toxicology of air contaminants.
- An appointed member representing organized labor.
- Two appointed members representing the general public.

All appointed members of the Air Pollution Commission serve three year terms.

The Environmental Protection Branch comprises the following major organizational components:

- Water Management Bureau
- Air Pollution Control Division
- Solid Waste Management Division.

The Water Management Bureau, in turn, is further subdivided into the following divisions:

- Water Control Division
- Hydrological Survey Division
- Water Development Services Division
- Municipal Wastewater Division.

Generally speaking, the Environmental Protection Branch is organized in such a manner that the work of the Branch is performed by essentially autonomous sections loosely combined into divisions. These sections vary in size from one to approximately 30 technical personnel. The technical complexity of these sections also varies greatly and tends to have differential impacts on the Branch as a whole. The activities of these sections and their organizational relationships are described in greater detail in other sections of this report. The reporting relationships of the Branch are also delineated in Figure 1.

Hydrological Survey Division

The Hydrological Survey Division is a functional component operating under the jurisdiction of the Water Management Bureau. A functional breakdown of this division is shown in Figure 2.

An overall picture of the organizational interfaces of this division, which is given in Table 1, also illustrates the varied nature of the activities and responsibilities that it performs. Many interfunctional

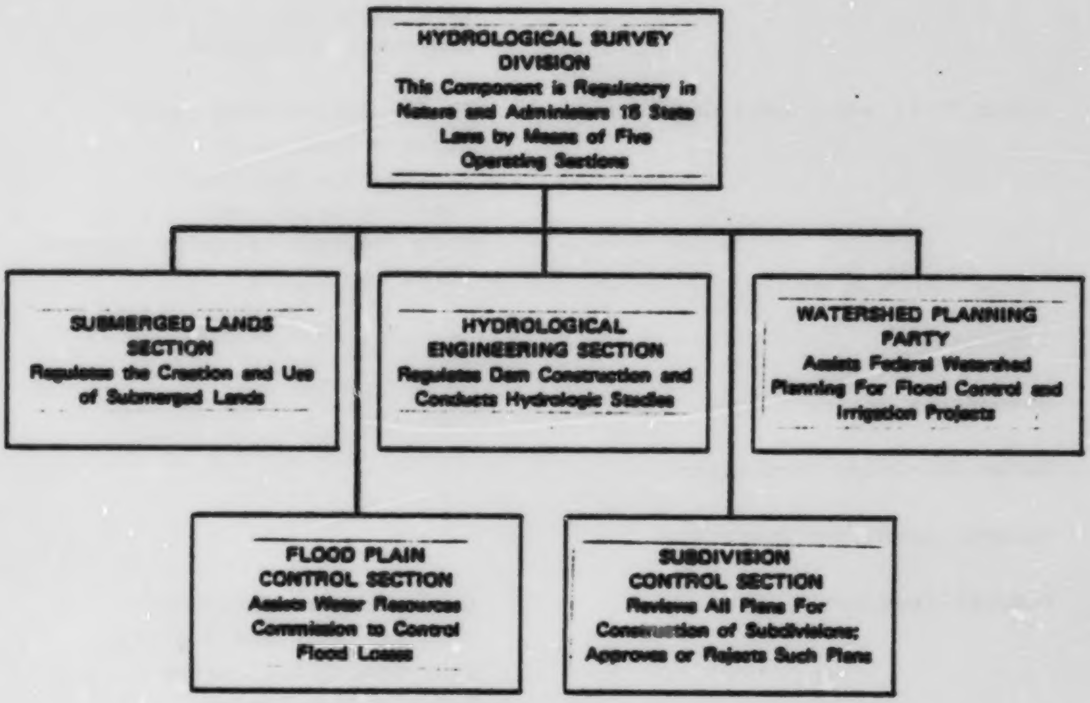
HYDROLOGICAL SURVEY DIVISION
This Component is Regulatory in Nature and Administers 15 State Laws by Means of Five Operating Sections
SUBMERGED LANDS SECTION
Regulates the Creation and Use of Submerged Lands
HYDROLOGICAL ENGINEERING SECTION
Regulates Dam Construction and Conducts Hydrologic Studies
WATERSHED PLANNING PARTY
Assists Federal Watershed Planning For Flood Control and Irrigation Projects
FLOOD PLAIN CONTROL SECTION
Assists Water Resources Commission to Control Flood Losses
SUBDIVISION CONTROL SECTION
Reviews All Plans For Construction of Subdivisions; Approves or Rejects Such Plans

FIGURE 2 HYDROLOGICAL SURVEY DIVISION

Table 1

HYDROLOGICAL SURVEY DIVISION

Major interfaces with the Department	Water Quality Control Division Fish and Wild Life Division Geological Survey Division Water Ways Division Parks and Recreation Division Land Division Engineering Division
Other State government departments	Public Health Department Highway Department Agriculture Department Commerce Department State Police Emergency Service Division
Legislature	
Governor's Office	
Water Resources Commission	
Natural Resources Commission	
Federal agencies	U.S. Corps of Engineers Soil Conservation Services U.S. Geological Survey U.S. Weather Bureau
International Joint Commission	Great Lakes Basin Commission Groups Considering Dredging

transactions performed within the Department have their inception in the work processes of this division. The division's interrelationship with important programs and activities inside and outside the department highlights the pivotal position that this component occupies as initiator, coordinator, and liaison agent. Because of this centrality within the network of Branch and Departmental operations, reduction in any area of functional efficiency through overload, redundancy, compartmentalization, or misperception of critical priorities can have unfavorable impacts on the operations of other departmental functions.

The functional significance of this division is further emphasized by the increasing volume of work that has accrued over the years. In 1966, the division processed 496 permit applications under the Inland Lakes and Streams Act; by 1972 the volume of permits processes had increased to 1,600, and by 1973 to approximately 2,500. Given the trend toward increased legislation of this particular sector, the volume and complexity of the work can be expected to increase even further in the future.

Table 2, which gives a functional breakdown of the divisional activities, indicates that more than 55 percent of the work performed falls within the category of issuing permits and licenses, and approving local ordinances. Technical services and liaison with the Commissions and state and Federal agencies account for the other significant portion of the work but essentially represents a rather small fraction of the entire work load. It is apparent that improved methods and procedures backed up by an effective information processing system will be an important consideration in coping with the increasing proliferation of paper work.

A summary of the major responsibilities of each of the sections is included in the discussion that follows.

Hydrological Engineering Section

This section is divided into two operating units.

Unit I, Lake Engineering Unit, is responsible for:

- Issuance of dam construction permits under Public Act 184 which requires that a permit be issued for all dams that will result in 5 acres of water or a body of water with a 5-foot head. This unit issues approximately 15 permits per year.

Table 2

HYDROLOGICAL SURVEY DIVISION FUNCTIONAL BREAKDOWN

	Estimated Effort by Section (percent of total)				
	Hydrologic Engineering	Subdivision Control	Submerged Lands Management	Watershed Planning	Flood Plain Control
Issues permits, licenses, and approval of local ordinances	33%	60%	56%	--	80%
Interactions with commissions	2	--	3	2	--
Surveillance and monitoring	15	--	2	--	--
Enforcement	10	1	2	--	3
Represent State, WRC, DNR on various study groups and commissions	5	1	1	--	--
Interaction with Federal agencies	5	10	20	10	2
Public relations	5	5	5	6	4
Provide technical services	15	10	2	70	10
Develop rules and regulations	1	1	2	--	--
Interact with the State Legislature and U.S. Congress	1	--	5	--	--
Prepare recommendations for the Governor	1	--	1	--	--
Process information and data	5	--	1	10	--
Other administration	2	2	--	2	1
Administer grants	--	--	--	--	--
Field reconnaissance	--	10	--	--	--

- Approval of plans to build dams or other structures to establish a lake level on a particular lake. There are approximately 30 such plans processed each year. The work in this unit is processed under Public Act 146 (1961) as amended.
- Work with local government jurisdictions to improve the lakes by such actions as weed control and dredging. There are 14 Local Lake Improvement Boards that have been established, of which 8 are still active. This unit represents the department in these matters and provides guidance and counsel to local boards under Public Act 345 (1966).

Unit II, the Hydrologic Studies Unit, is responsible for:

- Conducting hydrologic studies, including flood plain discharge and frequency estimates, drought flow forecasts for design of wastewater control facilities, discharges, and fisheries management problems.
- Provision of consulting engineering services to other departments within the state government such as the Highway Department.
- Work with other divisions within the Department of Natural Resources on joint technical studies such as fish poisoning.
- Performance of duties under administrative statutes:
  - Issuance of permits under Public Act 143 (1959) which requires an iron ore company to obtain permits to divert water for use in internal processes.
  - Performance of studies under Public Act 20 (1964) which is concerned with surplus water flow and requires the preparation of plans for the management of water (to be approved by the Water Resources Commission).
  - Assistance in organizing watershed councils as authorized under Public Act 253 (1964) and provision of information to these councils as well as advice and counsel as required.
  - Answering of inquiries and random questions related to duties as they arise.

Submerged Land Management Section

The primary objectives of this section are to administer two prime statutes--The Great Lakes Submerged Lands Act, Public Act 247 (1955), and the Inland Lakes and Streams Act, Public Act 346 (1972).

The major effort of this section is subdivided into the following categories:

- Issuance of permits to dredge and fill along the shoreline. During 1972 approximately 1,800 permits were issued under the Inland Water Act and 300 permits under the Great Lakes Act for a total of 2,100 permits; 80 percent of these permits were issued to individuals and created only minor changes in the environment, and the remaining 20 percent were issued for major construction projects, which created significant change in the environment.
- Clearance of title to bottomland that has already been filled.
- Review of all reports of island filling.
- Conduct of a public awareness program through meetings and seminars and issuance of information to the public regarding Departmental functions under the law.
- Implementation of all litigation against violators of the two acts through the medium of the Attorney General's office.
- Preparation of all legal documents related to land exchanges, legal conveyances, and bases and agreements for use of the Great Lakes submerged bottomlands. These documents are subject to approval by the Natural Resources Commission and the State Administrative Board prior to final execution.

Flood Plain Control Section

The principal responsibility for this section is to review all applications for occupation or alteration of the flood plain including:

(1) The main channel

(2) The entire overbank area of the flood plain.

Public Act 167 (1968) requires an individual or entity to obtain a permit from the Water Resources Commission before occupying or altering the channel of a water course.

The staff of the Flood Plain Control Section is responsible for studying each application and determining the proposed hydraulic effect of flood stage and direction of flow. The report on this proposal is then sent to the Commission along with an analysis of any potential detrimental effects that may result from an increase in the flood stage. The Water Resources Commission then determines whether or not the proposal meets the requirements of the law. If so, the Commission issues an order authorizing the permit. The actual preparation of the permit is performed in this section.

Subdivision Control Section

This section is primarily responsible for reviewing preliminary plat plans for proposed subdivisions, ensuring that all requirements under the various acts are met. This section also coordinated the preliminary plat plans with others in the Branch and recommends approval or rejection of these plans. Included in this review are such matters as:

- Ensuring that the flood plain (normally dry land that could be submerged if the highest stage in 50 years occurred) is shown on the map.
- Ensuring that there is a minimum of 3,000 square feet of land on each proposed lot that is above the 50 year flood level standard required under Public Act 288 (1967).
- Determining whether or not filling on the flood plain is involved and ensuring that all requirements under Public Act 245 (1929) and Public Act 167 (1968) are met.
- Ensuring that related requirements of cognizant divisions and sections of the Department are met.
- Ensuring that the final plat plan properly reflects all restrictions imposed in the preliminary plan review and the proposal makes no encroachments on State-owned land.
- Preparing a letter of approval to the applicant indicating the approved course of action.

Funds Control

Under Public Act 346 (1972), the Hydrological Survey Division is empowered to handle funds that are derived from applications for permits to dredge or fill along the shoreline. A schematic describing the cash flow and the control measures prescribed by the Auditor General is given in Figure 3.

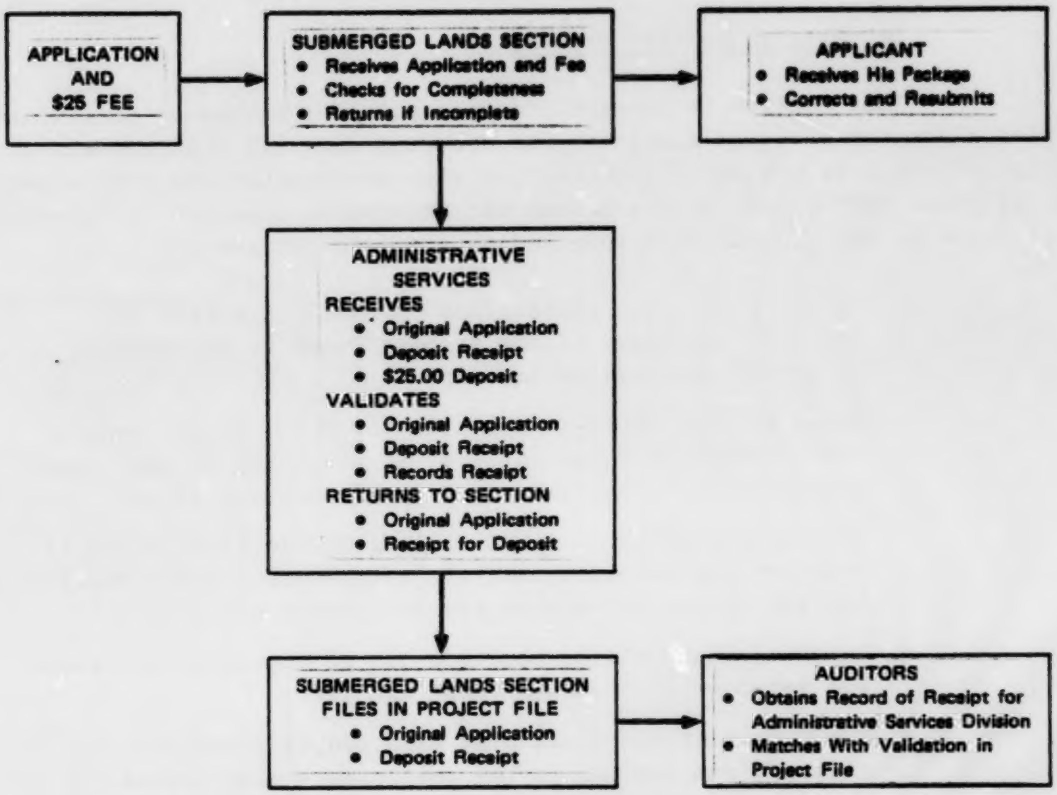
APPLICATION
AND
$25 FEE
SUBMERGED LANDS SECTION
• Receives Application and Fee
• Checks for Completeness
• Returns if Incomplete
APPLICANT
• Receives His Package
• Corrects and Resubmits
ADMINISTRATIVE
SERVICES
RECEIVES
• Original Application
• Deposit Receipt
• $25.00 Deposit
VALIDATES
• Original Application
• Deposit Receipt
• Records Receipt
RETURNS TO SECTION
• Original Application
• Receipt for Deposit
SUBMERGED LANDS SECTION
FILES IN PROJECT FILE
• Original Application
• Deposit Receipt
AUDITORS
• Obtains Record of Receipt for Administrative Services Division
• Matches With Validation in Project File

FIGURE 3 FUNDS CONTROL IN THE HYDROLOGICAL SURVEY DIVISION

Water Development Services Division

The Water Development Services Division is a functional component of the Water Management Bureau. Many of the activities within this division are closely coordinated with the Water Resources Commission. An overview of the key functions in the Division is shown in Figure 4 and a functional analysis of the Division's activities is given in Table 3.

A more detailed summary of the principal duties of the above sections follows.

Construction Grants Section

The primary responsibility of this section is to administer grants as authorized by the Water Pollution Control Act as amended in 1972, PL 92-500, effective 1972, and other Federal laws as appropriate at any point in time.

There are four kinds of grants now authorized under existing Federal legislation:

(1) Preliminary planning and studies

(2) Preparation of construction plans and specifications

(3) Construction

(4) Turnkey (probably none in 1974).

Approximately 350 projects have been established on the 1974 priority list for Departmental consideration.

The major actions performed by this section are to:

- Send out notices to communities who have expressed interest in applying for grants and advise them of deadlines for filing applications.
- Help the local communities to complete required forms and procedures.
- Review applications.
- Assign priorities based on statutory requirements.
- Notify applicants of priorities assigned.
- Invite personal contact if there is a disagreement with the applicant.

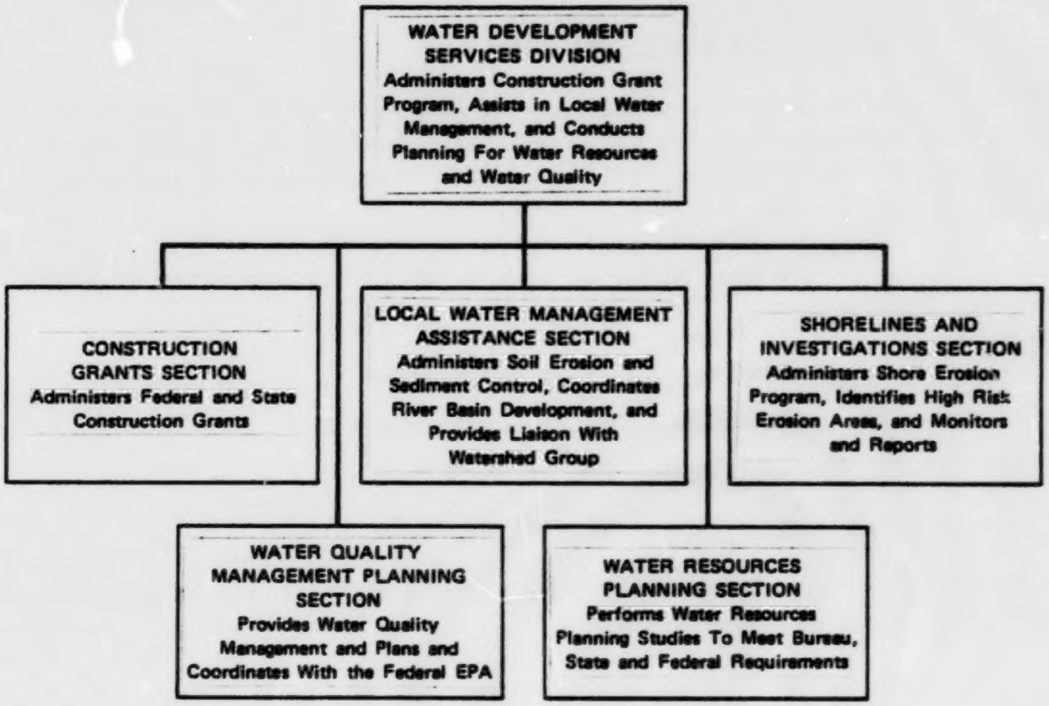
WATER DEVELOPMENT SERVICES DIVISION
Administers Construction Grant Program, Assists in Local Water Management, and Conducts Planning For Water Resources and Water Quality
CONSTRUCTION GRANTS SECTION
Administers Federal and State Construction Grants
LOCAL WATER MANAGEMENT ASSISTANCE SECTION
Administers Soil Erosion and Sediment Control, Coordinates River Basin Development, and Provides Liaison With Watershed Group
SHORELINES AND INVESTIGATIONS SECTION
Administers Shore Erosion Program, Identifies High Risk Erosion Areas, and Monitors and Reports
WATER QUALITY MANAGEMENT PLANNING SECTION
Provides Water Quality Management and Plans and Coordinates With the Federal EPA
WATER RESOURCES PLANNING SECTION
Performs Water Resources Planning Studies To Meet Bureau, State and Federal Requirements

FIGURE 4 WATER DEVELOPMENT SERVICES DIVISION

Table 3

WATER DEVELOPMENT SERVICES DIVISION FUNCTIONAL ANALYSIS OF WORK

	Estimated Effort by Section (percent of total)				
	Construction Grants	Water Resource Planning	Local Government Assistance	Shorelands and Resource Investigation	Water Quality Management Planning
Prepare recommendations for the Governor	--%	2%	--%	1%	--%
Interactions with commissions	15	1	5	1	--
Interactions with Federal agencies	--	5	5	1	5
Interaction with the State Legislature and the U.S. Congress	1	1	5	1	5
Represent State, WRC, DNR, or various commissions and study groups	2	31	5	1	5
Develop water quality management plans and water resource plans	5	30	48	5	75
Issue permits, licenses, and approve local ordinances	--	--	--	--	--
Surveillance and monitoring	--	--	--	39	--
Develop rules and regulations	1	--	2	1	--
Enforcement	--	--	--	--	--
Public relations	1	1	5	4	5
Process information and data	--	25	--	25	--
Administer grants	75	2	--	--	--
Provide technical services	--	--	20	14	--
Other administration	--	2	5	7	5

- Resolve conflicts and disagreements if possible.
- If differences cannot be resolved, the applicant is advised of his right to appeal to the Commission. The Department will then prepare information and administrative support for a public hearing.
- Present recommendations of priority at a public hearing.
- Adopt Commission decisions in respect to the priority list.
- Submit priority lists to the Federal government for approval.
- Inspect ongoing work.
- Receive and process payment requests.

Local Water Management Assistance Section

There are three primary areas of responsibility assigned to this section:

- Soil erosion and sediment control under PA 347 (1972)--This act provides for control of soil erosion to protect the water of the State from sedimentation and further provides for the mechanism to implement the act in the form of such things as rules, remedies, and penalties. This act took effect in July 1974. The rules for implementing the act were developed and circulated by the end of 1973, and public hearings were held in early 1974.
- Coordinate Federal, State, and local government interests in the Kalamazoo Blocks and the Paw Paw River Basin Development--This includes establishing an executive board to provide general policy direction, regional councils to ensure that regional interests are considered, and local task forces to provide local direction along with technical support for such things as to develop the plans and organize the data. This activity also includes documentation of a written plan for performing the work.
- Provide liaison with water shed groups as required--This work is performed chiefly by the section manager with a minimum of outside support.

Shorelands and Investigation Section

The work of this section is carried out through the medium of two operating units:

Shoreland Unit

- Administers shore erosion programs as provided under the terms of PA 245 (1970).
- Identifies and designates high risk areas of shore erosion on the Great Lakes Shoreland.
- Provides engineering studies to prevent undeveloped land from being developed in an undesirable manner.

Resources Investigation Unit

- Identifies other high risk areas.
- Monitors the risk areas annually to determine changes, and documents these changes.
- Determines which protection methods are working as designed.
- Gathers shore recession rates by use of aerial photographs and provides this data to local governmental agencies.

Water Quality Management Planning Section

The basic responsibilities of this section are to:

(1) Provide water quality management plans.

(2) Process official plans for adoption by the Water Resources Commission.

Certain aspects of the work that fall within the section's responsibilities are carried out by outside consultants. In these circumstances, the section's role is to administer the contractual agreements made with the consultants and monitor technical competence standards. This also includes obtaining EPA approval of consultant subcontracts and receiving reimbursement.

The working philosophy of this section is, "If you want to do it, we can help you with the financial aspects but you must meet certain requirements." This approach is significantly different than the enforcement philosophy of "do it--or else."

Activities of this section include:

- Provision of staff support for the Michigan Great Lakes Commission. The present Manager of the Water Development Services Division is the designated Alternative Commissioner and has a major role in executing the Commission's programs.
- Provision of staff assistance for the Interdepartmental Committee on land and water resources. The Committee was established by the Governor's Office and the Division Manager is also Chairman through appointment by the Governor. The Committee is composed of all State agencies (approximately 14) with responsibility for land management.
- Provision of assistance to the Land Drainage Board of the International Joint Commission. This effort is programmed for two to three years further existence.
- Other special assignments.
- Provision of administrative and technical support for the State agency designated by law to serve as Executive Water Personnel Planning Assistant, under PL 92-500 (Title 3).

Water Quality Control Division

The Water Quality Control Division is composed of the Water Quality Studies Group, the Enforcement Group--Region I, and the Enforcement Group--Region II. A functional overview of this Division is shown in Figure 5. A more detailed summary of the principal duties of these sections follows.

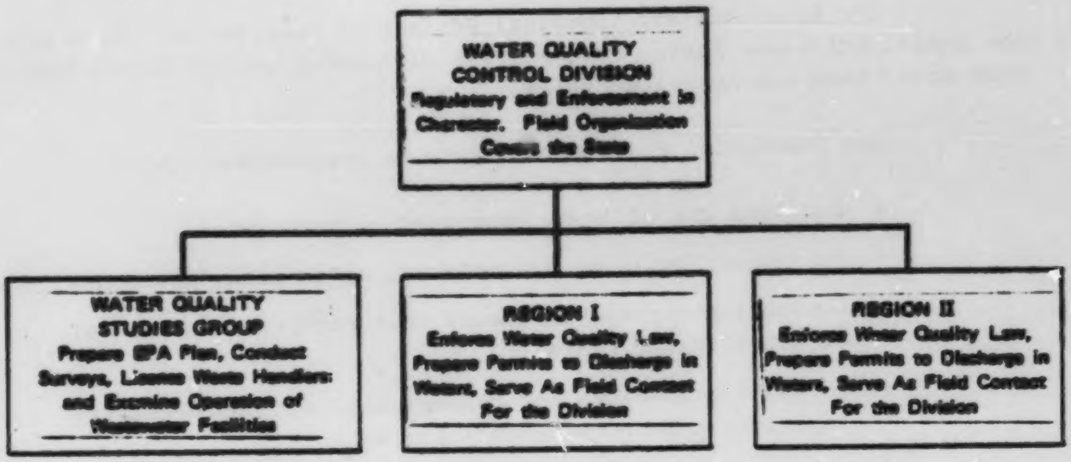
WATER QUALITY CONTROL DIVISION
Regulatory and Enforcement in Character. Field Organization Covers the State
WATER QUALITY STUDIES GROUP
Prepare EPA Plan, Conduct Surveys, License Waste Handlers: and Examine Operation of Wastewater Facilities
REGION I
Enforce Water Quality Law, Prepare Permits to Discharge in Waters, Serve As Field Contact For the Division
REGION II
Enforce Water Quality Law, Prepare Permits to Discharge in Waters, Serve As Field Contact For the Division

FIGURE 5 WATER QUALITY CONTROL DIVISION

Water Quality Studies Group

The Water Quality Studies Group is composed of five specialized sections:

- Water Quality Appraisal Section
- Oil Pollution Control Section
- Special Programs Section
- Laboratory Section
- Comprehensive Studies Section.

A detailed discussion of activities and programs assigned to each section follows.

Water Quality Appraisal Section

The Water Quality Appraisal Section is composed of two components--the Industrial Waste Survey Unit and the Biological Survey Unit. Their work activities are described below.

The Industrial Waste Survey Unit is responsible for:

- Sampling the effluent generated by industries.
- Designing, building and maintaining sampling equipment.
- Conducting surveys to ensure that requirements are met on a continuing basis.
- Conducting hearings and taking other actions necessary to ensure that requirements are met.
- Meeting periodically with enforcement personnel and industry representatives to discuss current activities and problems.

The Biological Survey Unit is responsible for:

- Conducting river surveys including the collection of aquatic insects above and below a discharge to determine the nature and extent of damage.
- Monitoring discharges from nuclear power plants and determining the impact on water quality.
- Conducting bioassays of marine life, including the use of mobile laboratories that are capable of covering extensive areas for the purpose of testing water from streams and taking analytic samples from lakes.
- Issuing permits to discharge chemical substances that produce skin irritations.

Special Programs Section

The Special Programs Section is primarily concerned with the following:

- Preparing and administering examinations to operators of industrial wastewater facilities.

- Providing tax exemption certificates for the installation of wastewater pollution control devices. This activity also includes examining sites, reviewing plans, and resolving all problems that interfere with the issuance of an exemption.
- Inspecting and issuing certificates ensuring that toilet facilities on boats meet the requirements of the boat pollution control program. There are approximately 400,000 active boats in the State. This necessitates close liaison and coordination with the Conservation Department, Sheriffs' Departments, and other internal Departmental personnel.

Laboratory Section

The Water Quality Control Division maintains two laboratories--one reporting to the Enforcement Division and located at Pt. Mouillee, which partially supports the monitoring and surveillance activities in the Detroit metropolitan area, and the main laboratory in Lansing, reporting to the Water Quality Studies Division, which performs all the water chemistry and pesticide analyses for the remainder of the Bureau of Water Management. This laboratory also provides analytical services to other departments of state government.

The Lansing Laboratory is equipped to perform a wide range of chemical determinations on wastewater and freshwater samples (e.g., all inorganics, all pesticides on critical materials register; other organics determinations are contracted to private labs). It performs around 100,000 individual determinations on 12,000 samples per year. Bacteriological analyses are performed by Public Health. In turn chemical analyses of municipal well waters are performed for Public Health. Analyses of fish and animal tissue samples for mercury and other heavy metals are normally performed by the Department of Agriculture Laboratory. Bioassays are conducted by the Water Quality Appraisal Section. About 80 percent of the Lansing Laboratory work is for the Water Quality Control Division while 20 percent is for others. About 20 percent of the laboratory's effort is devoted to quality control.

Comprehensive Studies Section

The Comprehensive Studies Section is one of the largest components in the Branch, with basic responsibilities in the following areas:

- Preparing the State Program Plan for submission to EPA.
- Preparing comprehensive studies with respect to the use of river basins and projecting possible impacts resulting from present and future usage. These are basically diagnostic activities.
- Performing long-term water quality monitoring exclusive of biological monitoring.
- Providing mechanized analytical reports required to support the activities of other sections in the division.
- Implementing the industrial waste surveillance program (approximately $1.2 million in fees is projected for FY74).
- Keeping informed about current usage of toxic materials in the state and identifying existing stockpiles of these materials.
- Licensing of industrial waste handlers with respect to approval of vehicles used and location of sites.

Municipal Wastewater Division

The Municipal Wastewater Division was recently transferred from the Department of Health to the Water Management Bureau of the Environmental Protection Branch under the provision of the Governor's executive order consolidating environmental protection activities and programs into the Department of Natural Resources. A schematic describing organizational relationships of this division is given in Figure 6.

All activities and programs performed in this division are covered under the provisions of Public Act 98 (1913) and include the following areas of emphasis:

- Approving the design of municipal wastewater treatment facilities.
- Issuing permits to construct wastewater construction facilities.

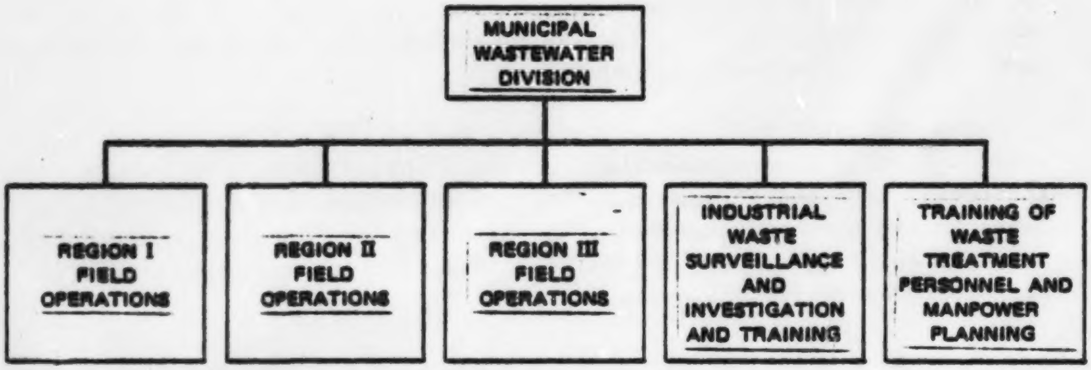
MUNICIPAL WASTEWATER DIVISION
REGION I FIELD OPERATIONS
REGION II FIELD OPERATIONS
REGION III FIELD OPERATIONS
INDUSTRIAL WASTE SURVEILLANCE AND INVESTIGATION AND TRAINING
TRAINING OF WASTE TREATMENT PERSONNEL AND MANPOWER PLANNING

FIGURE 6 MUNICIPAL WASTEWATER DIVISION

- Training operators to man municipal wastewater facilities.
- Conducting surveillance programs to ensure that conditions are maintained to meet effluent standards.

The division also maintains an extensive field operation. Under its present plan of organization, all field work in the division is performed within three regional subdivisions based on the following considerations:

- Region I--Covers all territory which drains into Lake Huron, Lake Erie, and Lake St. Clair.
- Region II--Covers territories which drain into Lake Michigan.
- Region III--Covers the entire upper peninsula.

The duties performed by this division are accomplished with a work force of 32 people. A functional breakdown of their work activities is shown in Table 4. It should be noted that 75 percent of all divisional activities fall into four main areas: issuance of permits and licenses, surveillance and monitoring, provision of technical services, and development of program recommendations.

The Municipal Wastewater Division, per se, is not involved to any great extent in direct planning functions. Staff members do become indirectly involved through consultation with communities and their engineers in the planning stages for the establishment of local water pollution control programs and the design, construction, and operation of municipal wastewater facilities.

A program where the division does get directly involved with planning is in municipal wastewater facility manpower development and training. This is accomplished by:

(1) Conducting an employment and planning survey to assess the labor related needs and characteristics at municipal wastewater treatment plants.

(2) Determining the current and expected future values of employment characteristics. This involves calculating turnover rates and estimating employment increases due to plant expansions and higher water quality objectives.

(3) Developing training plans and action steps in response to current and projected manpower training needs and problems. This is accomplished in close cooperation with the division's Investigation and Training Unit.

Solid Waste Management Division

The Solid Waste Management Division was also transferred from the Department of Health into the Environmental Protection Branch of the Department of Natural Resources under the terms of the Governor's executive order consolidating all environmental activities. As presently constituted, the division is organized into six sections, each representing a geographical area. All field personnel work out of the Lansing office except the divisional field representative for the upper peninsula who is now located in Escanaba. The basic work of this component is performed in support of Public Act 87 (1965) as amended in 1971.

Table 4

MUNICIPAL WASTEWATER DIVISION FUNCTIONAL BREAKDOWN

Activity	Percent of Total Time
Issue permits, licenses, and approval of local ordinances	25%
Surveillance and monitoring	20
Provide technical services	15
Enforcement	5
Interaction with Federal agencies	5
Public relations	5
Interaction with the State Legislature and the U.S. Congress	5
Develop program recommendations	10
Other administration	5
Represent State, Water Resources Commission, and Department of Natural Resources on various commissions and study groups	3
Prepare recommendations for the Governor	1
Interaction with commissions	1
Develop rules and regulations	--
Process information and data	--
Administer grants	--

The major work areas included in this division's effort are:

- Licensing of solid waste disposal facilities including land fills, open dumps, hog feeding operators, and incinerators. As part of this activity, the division also oversees plants that process waste materials and includes transfer stations as well as all transporting units in the State. In this particular case, it is the container not the vehicle that is licensed. The division also licenses junk collection centers established for collecting material to be recycled.
- Providing consultation to local governmental agencies in all spheres of solid waste management.
- Providing surveillance assistance and support to local health departments to ensure that the conditions prescribed under the licenses issued are met.
- Providing rules to be used by local governmental entities in developing plans for managing solid waste in their areas; and approving or disapproving such plans. Local entities dealt with include county boards of supervisors, city councils, township supervisors, and so forth. The plans involved include:
  - Identification and evaluation of alternative methods of handling solid waste.
  - Selection and justification of the proposed alternative.
  - Implementation schedules specifying what will be done and the time frames.
- Assisting the Federal government in implementation of solid waste programs.
- Conducting public information and public education programs on matters relating to solid waste management.

The functional distribution of this division's work is as follows:

- District Representatives--Spend 80 percent of their time in technology transfer and consultation with local health departments--including assistance in performing on-site inspections--and 20 percent in processing applications and performing miscellaneous administrative work.
- Headquarters Staff--Efforts in this area are devoted primarily to processing applications and performing administration duties. A more detailed breakdown of work is shown in Table 5.

Air Pollution Control Division

The Air Pollution Control Division was also transferred from the Department of Health into the Environmental Protection Branch of the Department of Natural Resources under the terms of the Governor's executive order, which consolidated all environmental activities into one functional component. As presently constituted, the division is organized into four sections, three of which perform technical duties and one which is concerned primarily with administrative functions. The organizational relationships are shown in more detail in Figure 7.

The basic work of the Air Pollution Control Division is performed in support of Public Act 250 (1965) as amended (Tax Exemption Act) and Public Act 348 (1965) as amended (Air Pollution Act). In addition, administrative rules for air pollution control have been promulgated under the authority of Public Act 348. A functional breakdown of work activities is shown in Table 6.

The Air Pollution Control Commission which maintains policy guidance over the activities of the Division has delegated some of its responsibilities and functions to air pollution control units of local government. The Wayne County Air Pollution Control Division covering most of Detroit Metropolitan Area operates with a large degree of autonomy.

The State is divided into six air quality control regions. The enforcement services are broken down into nine geographic districts (including Wayne County as one district). The enforcement districts and the air quality regions do not necessarily coincide.

The enforcement district offices are staffed with engineers and investigators. Four district offices have not been established at present. The engineers represent the Commission in their assigned geographic area

Table 5

SOLID WASTE DIVISION FUNCTIONAL BREAKDOWN

Activity	Percent of Total Time
Consultation	30%
Provide technical services	20
Issue permits, licenses, and approval of local ordinances	15
Interaction with Legislature and Congress	10
Represent State, Water Resources Commission, and Department of Natural Resources on various commissions and study groups	10
Enforcement	10
Surveillance and monitoring	5
Prepare recommendations for the Governor	Occasionally
Interaction with Federal agencies	Occasionally
Develop program recommendations	When needed
Develop rules and regulations	Only when needed
Other administration	When needed
Interaction with commissions	--
Public relations	--
Process information and data	--
Administer grants	--

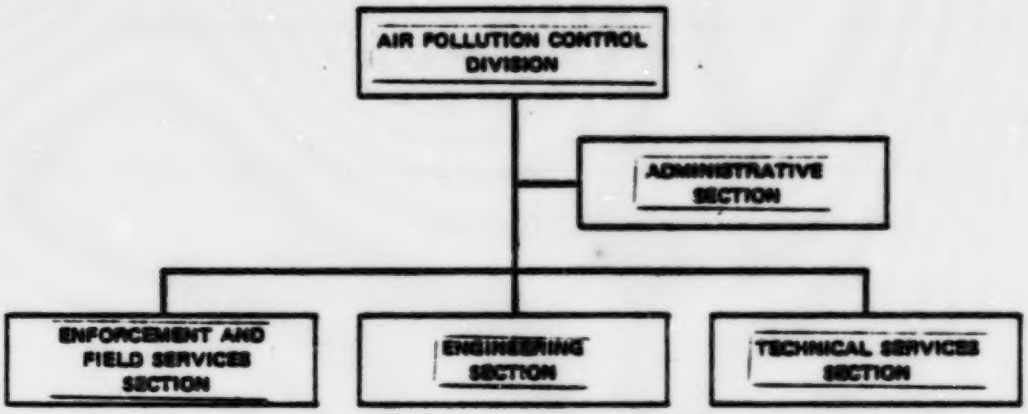
AIR POLLUTION CONTROL DIVISION
ADMINISTRATIVE SECTION
ENFORCEMENT AND FIELD SERVICES SECTION
ENGINEERING SECTION
TECHNICAL SERVICES SECTION

FIGURE 7 AIR POLLUTION CONTROL DIVISION

in all aspects of air pollution control activities; i.e., maintaining liaison with local governmental officials, including local health departments and local air pollution control agencies; making self-initiated investigations on a planned basis and other investigations on the basis of complaints or other evidence of violations; evaluating needs for community air sampling and source sampling; and planning, developing, and carrying out an effective air pollution control program. The investigators work under the direction of the district engineers and conduct source inspections (including visual emission evaluations), operate and maintain air monitoring equipment (including air monitoring trailers), and generally assist in the conduct of the district air pollution control program.

Permits are required for the installation of any new processing equipment that may be a source of air contaminants, for the alteration of existing sources, for the installation or alteration of emission control systems, and for the installation of incineration equipment. Engineers of the Engineering Section give the permit applications a critical review in light of the emission limits. The review also takes into account regional factors to assure that the proposed installation will not compromise ambient

Table 6

AIR POLLUTION CONTROL DIVISION FUNCTIONAL BREAKDOWN
ESTIMATED REPORT BY APCO

Activity	Percent of Total Time
Prepare recommendations for the Governor	1%
Interaction with commissions	5
Interaction with Federal agencies	3
Interaction with the State Legislature and the U.S. Congress	2
Represent State, WRC, DNR, or various commissions and study groups	1
Develop program recommendations	5
Issue permits, licenses, and approve local ordinances	10
Surveillance and monitoring	25
Develop rules and regulations	2
Enforcement	12
Public relations	3
Process information and data	8
Administer grants	1
Provide technical services	10
Other administration	12

air standards. An operating permit is issued after the installation is completed and observations, investigations, and possibly source emission tests demonstrate that the installation performs in accordance with the conditions of the installation permit and in compliance with all air pollution rules. This operational evaluation is conducted with district and central office technical personnel in cooperation with local air pollution agencies.

The Engineering Section conducts a statewide emissions inventory that is updated annually. In conducting the inventory, a questionnaire is mailed to establishments considered to be potential polluters. This is followed up by phone calls and investigations until all suspected sources have provided the data. The section also administers a tax exemption program for air pollution control facilities and a surveillance fee program. Special studies are conducted and the section performs the computer programming and data processing functions for the Bureau. The Technical Services Section conducts air quality monitoring and source surveillance programs and provides laboratory analysis and instrumentation maintenance support.

Manpower and Personnel

As part of its analysis of the Environmental Protection Branch, the SRI project team performed an assessment of the manpower and personnel functions that support the Branch operations. The primary focus of this effort was to determine how the Branch derived estimates of the amount and kinds of personnel required to meet organization goals. In modern practice, the objective of a manpower planning system is to establish a set of functional programs and activities oriented toward meeting staffing requirements, determining present staff capability, assessing labor market conditions, evaluating fluctuating service demands, and integrating these elements into a system for supporting organizational missions, goals, and objectives. Such a framework enables cognizant managers to formulate appropriate programs to meet their needs. Underlying such an approach are the following assumptions:

- Manpower planning is a derivative of the planning perspectives and posture of the organization.
- The tasks of manpower planning exist to identify, delineate, perform, and evaluate the human resource implications of the organization's planning projections.
- The central purpose of manpower planning is to develop and maintain the manpower capability required to support the organization's missions, goals, objectives, programs, and activities.
- The manpower planning system should also include the capability to determine present as well as future manpower needs of local pollution control agencies.

In performing the manpower planning function, personnel charged with the responsibility must be able to manage the forecasting process that translates missions, program plans, budgetary allocations, and changes in technology and facilities and productivity levels into short-term, medium-range, and long-range manpower requirements. The outputs of this planning process will be:

- Compilation of manpower needs by functional categories.
- Compilation of manpower needs by specific skills and experiential categories.
- Summaries of manpower requirements by Branch, division, lower echelons, and position categories.

An important element in this kind of a manpower system would be a manpower skills inventory with a capability for recording and indexing the experience, education, special skills, interests, job preferences, and training and development increments acquired by all categories of Branch personnel. Data generated by this system would:

- Enable manpower planners to identify individuals within the organization by significant, personnel, experiential, and performance categories.
- Enable planners to develop manpower profiles by programs, projects, groups, and other functional designations.
- Assist in programming training, job rotation, promotion, and succession planning.

A manpower concept of this type would require a backup system of data collection instruments, summary output forms, and reporting formats.

Manpower forecasts would be based upon an analysis of projected work loads, budgetary allocations, technology-man interfaces, and manpower supply and demand. The system would also take into consideration such process factors as attrition from all sources, promotions, transfers, training, and recruiting strategies. If appropriate and economically feasible, these programs could be produced by the use of computer technology. A simplified schematic design of the elements and processes incorporated in this model is shown in Figure 8.

In performing its assessment of the manpower and personnel functions in the Branch, the SRI project team used the above described manpower planning concept as a framework for guiding its efforts, deriving its findings, and recommending changes in the present mode of operation.

The responsibilities and disposition of the manpower and personnel function as it is currently consitituted is discussed in the following sections of the report.

Civil Service Commission

Article XI, Sections 5 and 6 of the Constitution of the State of Michigan specifies that the Civil Service Commission shall be nonsalaried and shall consist of four persons, not more than two of whom shall be members of the same political party, appointed by the Governor for terms of eight years, no two of which shall expire in the same year.

The Commission's powers are vested in a State personnel director who is a member of the classified service and who is fully responsible to the Commission. These responsibilities are to:

- Classify all positions in the classified service according to their respective duties and responsibilities.
- Fix rates of compensation for all classes of positions.
- Approve or disapprove disbursements for all personnel services.
- Determine by competitive examination and performance exclusively on the basis of merit, efficiency, and fitness the qualifications of all candidates for positions in the classified service.
- Make rules and regulations covering all personnel transactions and regulate all conditions of employment in the classified service.

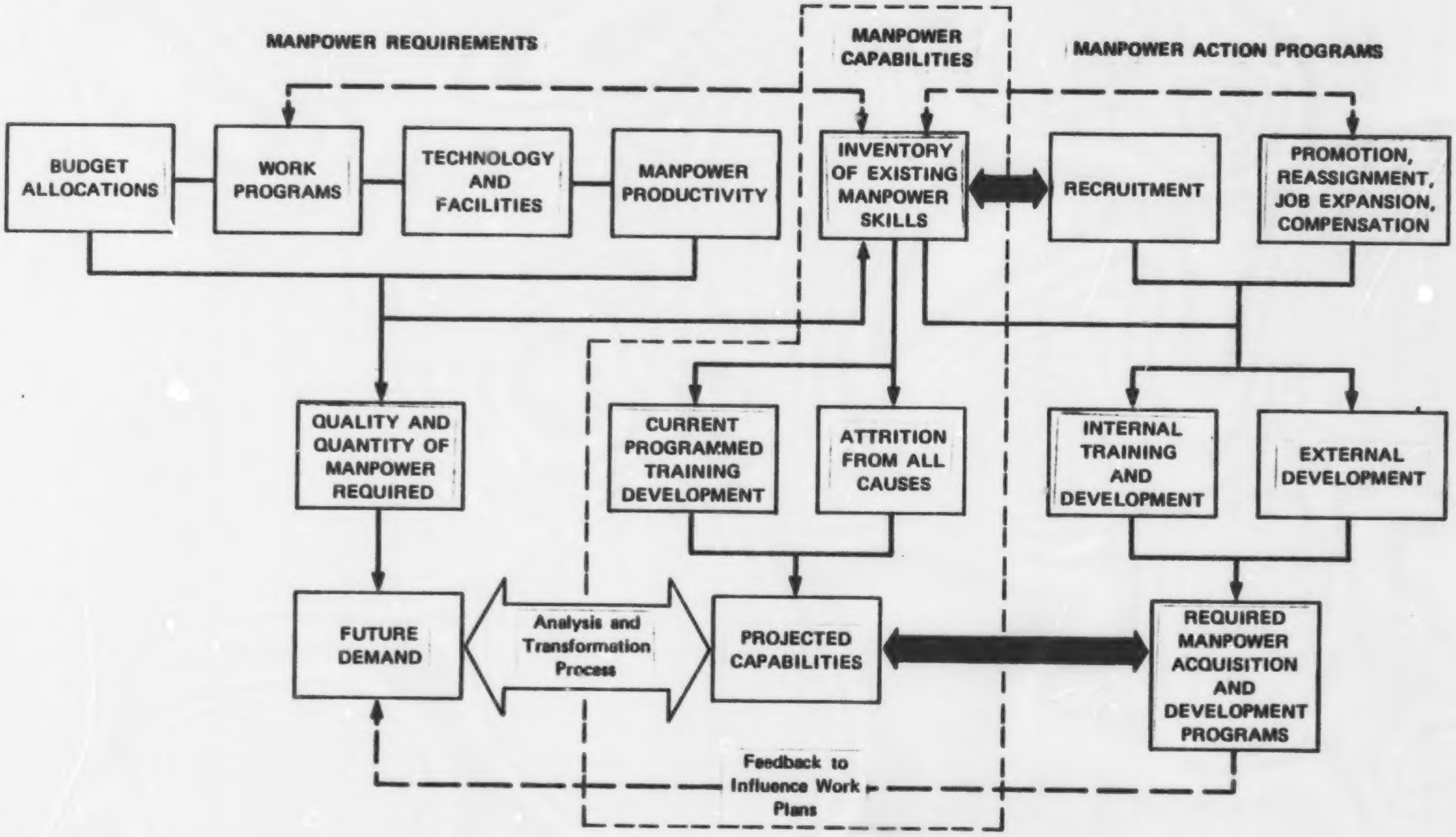
MANPOWER REQUIREMENTS
MANPOWER CAPABILITIES
MANPOWER ACTION PROGRAMS
BUDGET ALLOCATIONS
WORK PROGRAMS
TECHNOLOGY AND FACILITIES
MANPOWER PRODUCTIVITY
INVENTORY OF EXISTING MANPOWER SKILLS
RECRUITMENT
PROMOTION, REASSIGNMENT, JOB EXPANSION, COMPENSATION
QUALITY AND QUANTITY OF MANPOWER REQUIRED
CURRENT PROGRAMMED TRAINING DEVELOPMENT
ATTRITION FROM ALL CAUSES
INTERNAL TRAINING AND DEVELOPMENT
EXTERNAL DEVELOPMENT
FUTURE DEMAND
Analysis and Transformation Process
PROJECTED CAPABILITIES
REQUIRED MANPOWER ACQUISITION AND DEVELOPMENT PROGRAMS
Feedback to Influence Work Plans

FIGURE 8 MANPOWER PLANNING SYSTEM

Personnel Division, Department of Natural Resources

The Personnel Division reports directly to the Administrative Bureau Chief with the responsibility to provide personnel services to all management and employees of the Department of Natural Resources. These functional activities include the following:

- Interpretation of Civil Service rules, regulations, and administrative policies, Department personnel policies, and acts, regulations, and policies of other agencies allied with personnel.
- Preparation of all payrolls for the Department and maintenance of the establishment list, attendance reports, records of sick and annual leave, and records of compensatory time.
- Representation of the Department in hearings before various boards and commissions including the Civil Service Commission.
- Processing of all employment requisitions for new and vacated positions.
- Administration of the insurance program, unemployment compensation, workmen's compensation, social security, and retirement.
- Administration of training programs provided by the Civil Service Commission.
- Management of the Department's Equal Opportunity Affirmative Action Program.
- Processing of all classification studies.
- Conducting of employee grievance hearings and representation of the Department with employee organizations.

Office Management Section, Environmental Protection Branch

This section currently reports to the Deputy Director, Environmental Protection Branch, with the assigned responsibility to provide fiscal, personnel, and office services as required. Functional assignments include the following:

- Fiscal--Preparation of budget estimates, annual budget requests, and other supporting data; checking of all expense accounts, vouchers, and payrolls; preparation of all vouchers and field requisitions and responsibility for all other methods used in handling and accounting for agency funds; maintenance of all records on receipt and disbursement of Federal program grant funds and matching State funds for air and water pollution control, water planning, and solid waste management.

- Personnel--Verification of the Personnel Division's preparation and maintenance of all personnel forms and records in accordance with Department regulations and agency needs; understanding and interpretation of Civil Service rules pertaining to position descriptions, hiring procedures, retirement policies, leave and other absences, employee evaluation procedures, travel regulations, and equipment operation procedures.
- Office Services--Maintenance of all in-Branch service records, expense accounts, vouchers, and other forms necessary or desirable for fiscal, personnel, property, and other administrative matters.
- Purchasing--Maintenance of the quality and quantity of supplies, materials, equipment, and service required by the Branch; preparation of invoice vouchers and requisitions; comparison of deliveries with orders; and issuance of approvals or rejections as necessary.

Intergovernmental Affairs

The intergovernmental function is unique when compared with other subject areas covered in internal management studies. Intergovernmental factors affecting agency processes are generally external to the organization, often beyond its power to control, and may operate with disregard for the internal problems that result from their impact. Analysis of this function requires a capacity for looking at the force, effect, and influence of legislation on all governmental units and agencies and an ability to relate common elements of these impacts back to the internal management and organizational needs of the agency. A successful intergovernmental affairs program therefore depends upon the development of a careful, realistic, and sympathetic evaluation of the aims, positions, and needs as well as the political and legal responsibilities of the governmental entities involved. Formulation of a pertinent intergovernmental strategy requires that all these factors be accurately assessed and taken into account.

The SRI analysis indicates that Michigan has long enjoyed a reputation for sound, responsive intergovernmental relations in its environmental protection programs. The State has developed and maintained effective

State-Federal and State-local-regional relationships in a period when many sister states have experienced much tension and conflict between these levels of government in environmental matters. Because of the aggressive and competent leadership of personnel responsible for environmental protection, the State has played an important role in developing and influencing Federal policy in this area. This combined with a positive legislative and administrative approach to Federal requirements has been instrumental in pushing Michigan to the forefront in environmental protection management. As a result, Michigan's intergovernmental relations have benefited in the following ways:

- Reduction of conflict between State and Federal requirements.
- Capacity to make positive use of Federal requirements and funding in support of state programs.
- Constructive working relationships between State and Federal administrative personnel responsible for developing policies and guidelines, standards, and operational programs in environmental protection.
- An informed legislature able to assess the impact of Federal requirements and funding opportunities within the context of the State's needs and organized to respond quickly and effectively with State legislation designed to translate these realities into compatible State authorizing programs.
- Informed and balanced Commissions which develop the rules and regulations for carrying out legislative requirements and set the policies and guidelines for administering the responsibilities and programs assigned to their jurisdictions.
- County, Municipal, Township, and other specialized units of local government whose needs and problems with respect to environmental protection are acknowledged and incorporated in State programs and effectively represented by the State government in its interactions with Federal agencies.
- State leadership in policymaking and program development on international and interstate Commissions in which the State of Michigan participates.

The field of intergovernmental relations, by its very nature, possesses a high potential for conflict and adversary behavior. This results from traditional concepts of federalism which, in the past, have tended to establish static patterns of hierarchical relationships with the Federal government placed at the apex of the pyramid of Federal-state-local governments. In its approach to program development, the State of

Michigan has evolved an intergovernmental relationship style that resembles a cooperative partnership with the different governmental entities who may be engaged in similar environmental protection endeavors. In doing so, the State has been successful in reducing much of the nonproductive conflict that often characterizes intergovernmental relations. At the same time, the State has retained necessary mechanisms for handling legitimate areas of disagreement through negotiation and adjustment processes that are appropriate to the governmental interests involved. This constructive mode of operation provides a meaningful precedent for developing new State roles that may be needed to meet evolving administrative requirements for coping with the complexities in intergovernmental aspects of environmental protection.

The conduct and regulation of transactions between cognizant governmental entities within the United States is rapidly undergoing significant changes; this is especially evident in the environmental field. These shifts result from fundamental changes in the exercise and delegation of governmental authority at the Federal level. Recent Federal trends in legislative and administrative practices seem to indicate that the Federal government has assumed the significant policy role of developing the guidelines, standards, operational parameters, and conceptual requirements for environmental protection programs while assigning the implementation and enforcement roles to the states. Under this concept, the Federal government will still retain overall supervision and backup enforcement authority. It is quite apparent that this emerging governmental thrust will probably necessitate major shifts and realignments in the conduct of intergovernmental relations.

These new directions in the exercise of federal authority present the states with unique opportunities and challenges at all governmental levels. An evolving and demanding role for the states is that of the "honest broker" charged with distributing authority and responsibility to local jurisdictions within the context of two apparently conflicting trends: the perceived national need to centralize, standardize, and monitor the critical parameters of environmental protection, and the equally urgent need to return governmental decision making and control to the lowest level of government--that is, to the people. The obligation for reconciling these different processes will fall most heavily on the shoulders of those officials responsible for ensuring state action. The states will also be expected to assume full responsibility for the development, implementation, and support of their own environmental programs adapted to the unique requirements of their constituencies. To successfully accomplish this complex undertaking, the states will be required to develop new patterns of intergovernmental participation. Furthermore, this role of intergovernmental management will be performed against a background of increasingly complex, interrelated institutional, technical, and socioeconomic problems associated with environmental protection.

Within this evolving pattern of events, the field of intergovernmental relations assumes a new significance as an integral part of governmental program requirements and processes. Intergovernmental relations has indeed become a substantive element in modern government practice; its role has been subtly implied in the past but more clearly expressed in recent legislative enactments. The "Water Pollution Control Act Amendments of 1972" (Public Law No. 92-500, 86 Stat. 816, approved October 18, 1972) is an example of this new reality. Included in this legislative design, as well as in the regulations developed and promulgated within its framework, is a complex network or planning structure designed to link a wide spectrum of interdependent elements into a systematic process for decision making, operations, and implementation in water quality programs.

These developments will have considerable practical impact on the operations of the Department of Natural Resources. The Environmental Protection Branch will be required to evolve new programs and management styles for the intergovernmental function. An increase in interactions with local elected officials and representatives of organizations with environmental interest can be expected; more individuals and groups will desire more intense participation in development of complex environmental plans and programs particularly if these activities have social, political, economic, or recreational impacts on local or regional interest. Branch mangement will be required to augment their skills in such disparate activities as consensus building, conflict management, and the provision of assistance in negotiating the allocation of burdens and benefits among Michigan's local jurisdictions and the constituencies they represent.

In the area of water quality alone, Branch management will have to work closely with different groups or clusters of local units of government on matters related to water quality planning, operations, and control. Its responsibility for statewide water quality standards will require the Environmental Protection Branch to maintain an equitable basis for dealing with local and regional jurisdictions in setting the critical parameters governing their planning requirements especially in such sensitive matters as availability of funding, industrial pretreatment requirements, and effluent limitations. All Environmental Protection Branch actions will invite close scrutiny and comparisons with restrictions and requirements imposed on other areas of the State.

To effectively manage the intergovernmental function, Branch management will need to develop formal systems and methods for monitoring and controlling its diverse processes: plan management; interlocal agreements; intergovernmental coordination; grant processing; scheduling construction, monitoring, enforcement, compliance, and the like. The local/regional jurisdictions will also expect the Branch to provide governmental processing support as well as technical expertise in formulating their substantive programs and services.

This requirement for enhanced capabilities in intergovernmental processing is also related to subtle integrating factors that are rapidly becoming critical to all aspects of environmental protection. Programs in air, water, solid waste, resource recovery, and land use planning can no longer be considered independent functions to be dealt with in isolation. In a growing number of cases, the advent of sophisticated technology has made possible flexible trade-offs of different kinds and qualities of discharges between the environmental resources of air, water, and land to achieve desired end results. It is no longer possible to ignore these interdependencies when making decisions that affect allocations of discharges, either on a case-by-case basis or on matters related to broader regional and statewide environmental protection issues.

Because it will be necessary for the Branch to recognize and deal with these interdependencies, the complexities of its intergovernmental processes will grow. The importance of the intergovernmental function within the context of the organization is also apparent, especially in light of recent amendments to the Water Quality Act, the developing body of administrative rules and regulations implementing the act, and newly emerging administrative issues related to air quality, transportation planning and control, and pending omnibus of solid and hazardous waste control legislation. These dynamic processes, coupled with possible major shifts in the locus of government authority, suggest that the Branch requires a new perspective with which to view its present intergovernmental operations.

Stakeholder Processes in Environmental Protection

During the course of this study, the SRI project team conducted intensive interviews throughout the State with individuals from the different interest groups who represented a distinct point of view toward environmental protection activities in the State of Michigan. Although it was not possible to contact all the interested groups because of time and budgetary constraints, it is felt, however, that the interview sample on which the following discussion is based is a reasonably representative cross section of key groups with a meaningful stake in the State's environmental protection activities.

The essential focus of the SRI survey was to determine the scope and programmatic thrust of each interest group. This step was deemed necessary because such groups exert an important and legitimate influence on the character and direction of the Branch's environmental programs. Because the aims and prescriptions set forth by these groups are often conflicting, it is essential for the management of the Branch to fully understand stakeholder interests and their possible effects on the public interest when developing the State's strategic posture with respect to policies, programs, and actions.

Environmental protection laws and programs consist of regulatory or enforcement activities coupled with alleviative measures designed to mitigate inequitable impacts. For example, the requirement for industry to meet water and air quality standards is mitigated by provisions in the laws that extend tax exemptions to those facilities that must be installed by industry to comply with a given set of standards. Also, under State and Federal policy, municipalities are given grants for constructing wastewater facilities but at the same time are brought under legally enforceable requirements to provide and operate such facilities according to specified performance standards.

The policy framework established by legislative action suggests the desire to maintain an equitable balance between the obligations imposed upon private and public entities by exercise of the State's regulatory powers and the recognition that such entities are entitled to reasonable redress from these burdens because of the public benefit that is likely to accrue from these transactions. The Environmental Protection Branch and its Commissions, because of their roles as implementing agents of this legislative framework, receive considerable attention from a wide spectrum of interest groups who are impacted by the resulting operative actions. Even with the expressed intent to maintain a reasonable equitable balance, it is clear that the burden of environmental protection is likely to fall more heavily on some groups than on others. On the other hand, it is also apparent that all the desires and expectations of groups interested in enhancing and protecting the environment cannot be met regardless of the best of intentions.

Under these circumstances, the management of the Branch is confronted with the responsibility for resolving complex issues into decision processes that are reasonable, equitable, and in the public interest. This task is even more formidable because the resulting decision must be developed within the context of inconsistent and often conflicting stakeholder values, perspectives, and interests. It stands to reason, therefore, that the more easily and readily the stakeholder groups can perceive the environmental programs and activities of the Branch as a legitimate and fair-minded exercise of its powers and responsibilities, the greater is the likelihood that the Branch will receive public support in administering legislative programs.

The SRI project team found a broad base of public support for the quality, competence, and reasonableness of the Branch's performance among the stakeholder groups that were interviewed. Although some of the groups interviewed hold sharply critical positions based on differences resulting from opposing philosophies and expectations with respect to the current direction and thrust of Branch programs and activities, in no case did any group feel that its position was absolute or nonnegotiable. There appeared to be a general recognition that the adversary nature of their position was founded on goals and objectives that must compete with those of other interest groups desiring to influence the overall direction of the State's environmental programs.

It was also apparent that those interest groups most actively engaged in the attempt to develop broad bases of public support for stronger environmental programs were, for the most part, inclined to assume a long range view of the effort required to bring their programs into being. These groups hold strong views on what constitutes effective environmental protection and are not easily discouraged by adverse decisions or setbacks. In the main, their efforts are directed toward the accomplishment of the fundamental objectives underlying their programs. They are seldom distracted by transient issues that are not directly related to their central concepts. Such stakeholder groups serve an important function in maintaining the long-term stability required to develop affirmative environmental protection programs.

A substantial portion of the criticism generated by stakeholder groups is based on careful study of the complex issues involved. It is fair to say that the Branch is subject to a wide range of competent criticism from industrial and commercial interests adversely affected by the programs of conservation and environmental groups seeking stronger regulatory measures or other groups with related but indirect interest in these activities. In this respect, the Branch is indeed fortunate to be stimulated and challenged by informed and constructive criticism directed toward its programs and actions. The SRI project team found most of this criticism to be temperate and responsible.

Michigan's stakeholder groups vary from formally organized special interests of long standing to loosely associated groups of individuals joined for the purpose of addressing a specific action of a Commision. A representative listing of these groups is shown below:

- Construction and economic development interests
- Conservation clubs
- Agricultural interests, associations, and clubs

- Lumber interests
- Associations representing industry and commerce
- Municipal, County, and Township associations
- Environmental protection groups
- Tourist and recreation interests
- Hunting and fishing interests
- University centers
- School groups and educational programs
- Civic associations
- Student groups and student associations.

The strength of the State's present environmental programs is founded, in part, on the capacity of a balanced spectrum of groups to perceive their own self-interest, to organize their programs effectively, and to present their points of view on significant issues in public competition with other points of view. The various components of the Environmental Protection Branch have been effectively handling their relationships with the State's stakeholder groups but usually on an individual basis. The recent executive order which consolidated the State's environmental protection activities into a single branch within the Department of Natural Resources offers the State of Michigan an excellent opportunity to develop a new management posture for meeting evolving stakeholder needs and requirements in the future.

IV TECHNICAL OPERATIONS

Technical operations, as defined by the SRI project team, are those functions that utilize the principles, findings, and methodology of science and technology. Practitioners of technical operations are usually trained in some aspect of the physical, biological, social, and engineering sciences. Not all activities subsumed within this concept are technical in nature. Within an organizational setting technical operations can also be related to either individuals or the jobs they perform; more specifically, technical operations refer to those aspects or functions of the work situation that are technical in nature. In the discussion that follows, the scope of technical operations will be viewed in terms of the above definition but must also be conditioned by the definitions given the remaining organizational functions discussed in this report.

The technical operations of the Environmental Protection Branch of the State of Michigan's Department of Natural Resources have been examined within the framework of a technical concept of environmental protection. The results of this assessment are presented as a series of findings and recommendations that can be applied both as generalizations pertaining to the Branch as a whole or as specifics that relate to a particular organizational component or activity. The environmental concept, used in this study as the basis for deriving the SRI findings, is discussed in the following sections of this report.

It should be emphasized, however, that the findings and recommendations relevant to the technical operations within the Branch may also have some impact on those findings and recommendations derived for the other functional elements. Apparent conflicts can be resolved by compromise or by ranking the limited goals served against some broader objectives.

The purpose of environmental protection is to restrain the rate of environmental degradation; that is, to slow, stop, or reverse processes that may be considered deleterious to predetermined standards of environmental quality. The expression "environmental degradation" raises two questions: What is the environment, and what is meant by degradation? In the case of environmental protection, the environment has several meanings. It can mean the physical environment, such as the level of a lake, the flow of a river, or the contours of the land. This term may also refer to the biological life space of fish or wildlife habitats or

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even the ecological system that sustains a sport fishery. The concept may include the total human situation, such as physical and psychological health, and socioeconomic well-being. The particular definition of environment that is used is often a function of the way the environment is measured or used. Degradation, on the other hand, is a value laden term for undesirable change. Because values are derived from human beliefs, perceptions, and needs, they are usually expressed in a pattern of priorities established by societal consensus.

Environmental change results from both natural processes and the actions of man. The natural process of flooding may produce undesirable change, if man has chosen to settle in the flood plain. Disposal of the residues of man's activities in the air or water or on land may produce undesirable changes because the uses of these media may become less wanted and more costly. Accordingly, environmental protection functions to intervene in the various natural and human processes to establish a priority of uses. This statement implies that the mode of intervention can be readily related to its effects. To do so requires a detailed understanding of the environmental system from several points of view:

- What are the cause-effect relationships between man's activities, environmental characteristics, and the biological systems that depend upon the environment?
- What are the possible modes of intervention by environmental protection and how do the effects propagate through the entire system?
- How can the effects be measured and how do the measurable effects relate to the objectives desired as environmental protection?

Human actions that affect the environment and their resulting impact on the social system are accompanied by a pattern of transactions that involve individuals and interest groups. In the former situation, these transactions represent causal elements, and in the latter, corresponding effects. Such transactions carry implicit and explicit values such that, if the system could be traced, these would represent a redistribution of values. This redistribution of values identifies, in effect, the costs and benefits as well as the recipients for a given action having environmental effects.

Governmental protection agencies have often intervened at this transaction level. Environmental protection agencies have generally granted permits to build, remove, modify, or discharge without an overall environmental perspective. Rather, there appears to be a heavy dependence upon technical criteria established within the agencies' authorization powers. These standards can be readily expressed in physical-chemical or biological terms; they can also be developed for a variety of reasons. Some examples are:

- They represent a certain level of public health
- They represent protection of certain uses
- They represent a level of technical feasibility
- They are easily administered
- They treat everyone equally
- They represent a compromise of different interests
- They are easily measured properties.

Environmental objectives and standards are established in the authorizing legislation often in broadly defined terms that may invite varied interpretations. It is commonly held that they are an expression of the will of the people. Inasmuch as such standards can be applied generally, this may approximate the situation if the legislative process is truly representative. In any case, this is the level at which political settlements are made among conflicting interests. This situation may be theoretically applicable in a general sense but may require practical adaptation to fit the specific case. As standards are developed and applied through the permitting process, there may be strong local interests and opinions to consider. The process must be capable of accommodating this body of opinion if it is to function successfully.

The basic function of granting permits for individual actions that meet specified standard conditions and are responsive to local interests is institutionalized in the environmental protection agency. From a technical point of view, this requires several direct and ancillary functions:

- Predicting the effects of an action. As a minimum this will require a determination that standards be met. However, there may also be broader interests to be satisfied that will require determining the resultant environmental quality, biological effects, or socioeconomic impacts.
- Surveillance of the action. This requires a determination that the action is accomplished under the conditions imposed. Inspections during and after construction and operational monitoring are vital activities.

- Monitoring of the effects. The effects will be manifested as incremental changes in environmental quality, biological effects, and socioeconomic impacts related to individual and collective actions. However, these changes can only be related to the systems in which they are felt. Therefore, candidates for effects monitoring include parameters related to the incremental changes, measurements of baseline characteristics, and descriptions of the relevant systems and the interaction process.

- Special studies. Certain characteristics of affected systems and interaction processes can best be determined by carefully designed studies rather than long term monitoring. These may be analytical, laboratory, and field studies having specific objectives, a carefully delineated scope, and a limited duration.

- Planning. Because the demands will exceed the available resources, at least initially, planning is required that evaluates alternatives and sets a priority for addressing the set of desired and necessary actions. The criteria for ranking proposals should be related to the need for environmental improvement, the improvements to be provided, the anticipated biological effects, socioeconomic impacts, and local concerns, and the resources necessary.

- Awareness and public participation. The technical facts of a proposed action should be explained to the concerned and affected public in terms that they can comprehend if their opinion is to be based on an informed judgment. In turn, the expressions of public sentiment must be related to the technical aspects of the proposed action. Public participation is an information exchange process that is accomplished by translating between sophisticated and detailed technical knowledge and the layman's language and point of reference. The difficulties involved in accomplishing this objective should not be underestimated.

- Data processing, storage, retrieval, and display. The environmental protection functions listed above generate the requirements to handle large amounts of data, to conduct repetitive complex calculations; to develop correlations, trends, and functional relationships; to model complex systems; to evaluate and rank alternatives against objective criteria; to generate exception and trend reports; and to display results in the form of graphs, maps, and pictorial representations. Therefore, this data management function is an important support to the other functions listed.

- Technology acquisition. The technical operations functions of environmental quality protection requires a current knowledge of technical facts, concepts, procedures, and methodologies. This is embodied primarily in persons but often for an expression in practice requires interaction between a knowledgeable individual and a complex machine or instrument. Knowledge is constantly increasing and new machines are constantly being devised; thus, technology acquisition is a continuous process of training and education as well as equipment procurement.

At the state government level, these functions may be split among different organizational entities in several ways. The division may be according to disposal media (air, water), categories of waste (liquid, solid), some combination of media and categories (air, water, solid), or some jurisdiction over type of actions involved (water resources, highway construction) or type of effect generated (fish and game, public health). The tendency, which is exemplified by Governor Milliken's executive order, is to bring these functions together into a single agency. The problem of conducting an effective program then shifts from a posture of interagency coordination to that of organization structure and management effectiveness.

The current state of the environment gives rise to State institutions responsible for maintaining the quality of the environment that respond, for the most part, to two sets of mandates: those derived from the Federal government and those imposed by the state legislature. In practice, Federal mandates are generally incorporated into state laws to which the state agency is directly responsive. Accordingly, there are Federal-state programs and state-only programs. The detailed requirements of Federal programs that relate to the technical functions to be conducted by the state agency are promulgated in a series of Federal regulations and guidelines. Although Federal programs provide funding support for state environmental activities and make provision for Federal intercession in the event that responsibilities mandated to the states are not performed, ample room remains for the states to express their own philosophies, management styles, and application of technical capabilities. Under these circumstances, it is not surprising to find that response patterns of the states do not follow a uniform course; indeed, the variety of state responses often places considerable management pressures on the staffs of the Federal administrators.

The Federal government has taken an aggressive role in developing the policy framework for environmental protection. At the same time, however, several states have initiated strong innovative programs in many areas. When the Federal government has moved legislatively or initiated a rule-making action in an environmental area, there has been a tendency to promulgate the minimum it wishes to achieve nationally. In this process, the Federal government does not ignore the need, wishes, and experiences of the states, but the end result of this action is to preempt most state action except that necessary to respond to the Federal mandate. Therefore, the Federal momentum and direction both with respect to legislation in environmental areas that are not adequately protected and with respect to rule making in areas that are for the time being legislatively settled are a clear indication of the manner in which the technical functions of environmental protection will have to be conducted at the state level.

Several important directions can be discerned in Federal environmental initiatives:

- Environmental regulation on an intermedia basis. Existing air and water quality legislation independently put severe limits on the discharge of residual materials to these media. As a result, more of the material that is difficult to treat so that it may be discharged to the air or to water bodies is being disposed on the land. Legislation has been introduced to control these hazardous wastes. The legislation would store the most hazardous wastes in Federally operated repositories. The less hazardous materials would be disposed by commercial operators on licensed sites. The development of regulations to implement state programs to conduct a hazardous waste program could provide a vehicle for rethinking the intermedia implications of existing state implemented Federal programs.
- Land use implications of environmental regulation. It is evident that air quality standards cannot be met by applying emission limits to all sources. Nevertheless, in some situations the concentration or numbers of sources will have to be brought under control. Federal regulations with respect to transportation controls, complex sources, and nondegradation are significant excursions into control of the use of land. It is likely that control of discharge of wastes from point sources into waterways will be supplementary measures to achieve adequate water quality in many areas. If technical solutions to the problem of pollution from dispersed or nonpoint sources cannot be found, the only recourse will be to control the use

of land from which the pollution runs off to the waterway. This may be accomplished through control of land use or the activities that take place on it or perhaps indirectly through the materials applied to it. Broad Federal land use legislation is now pending; implementation at the state and local level will require accommodation to the land use imperatives of environmental quality regulation. In addition, there may be environmental quality implications of land use policies. Other special areas of proposed land use control in which environmental quality can be affected include coastal zone management, siting of energy facilities, and surface mining.

- Resource recovery. The recovery of resources from residual materials will gradually take on an increased importance in environmental quality protection. The principal focus will be the solution of solid waste problems in metropolitan areas. However, as increasingly strict air and water emission limits are applied, industrial operations will seek and find resource recovery opportunities within a plant and among industries. State agencies can act as a clearinghouse to facilitate intercompany transfers of residual materials. The recovery of resources from solid waste materials will focus on three concepts. These include the recovery of energy from the organic fraction of the solid waste, the recovery of secondary materials that could be recycled and used by various industries, and the direct reuse of selected materials. Wastewater reuse will take on increasing importance. Direct reuses will become important in some water-short areas. Indirect reuse, such as land disposal and groundwater recharge, may become feasible alternatives to other modes of wastewater treatment. The energy content of heated wastewater may become an important resource for several different uses. The concept of resource recovery reinforces the need for an intermedia approach to environmental quality protection. It also broadens the scope to include regulation of materials that are used in products and the design of the products themselves.

- Public participation. The most recent major Federal environmental legislative mandate, the Water Pollution Control Act Amendments of 1972, states in section 101(e): "Public participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any State under this Act shall be provided for, encouraged, and assisted by the Administrator and the States." The rules and regulations relevant to State Program Elements Necessary for Participation in the National Pollution Discharge Elimination System that have been published describe procedures for public notification of proposed actions and hearings, the format and content of documentation to be made available, the facilities for public viewing of relevant materials, the protection of confidential information, and the procedures for determining the need for and conducting of public hearings. The states are encouraged to expand upon the rules given. The art and science of achieving effective public participation in highly technical decisions is still in an embryonic stage. As the process now works, the responsibility rests largely with the public. It takes a determined, skillful, intelligent, and articulate individual to influence the decision-making process. In the future the responsibility can be expected to fall on the agency. It will then be its responsibility to seek and obtain a valid picture of representative public sentiment.

- Regionalization. Both the Federal air and water quality legislation allow for and encourage planning and administration of environmental quality control programs by regional agencies. The rationale is that problems that extend across jurisdictional lines can best be solved by an agency whose authorities extend across the same boundaries. A further justification, which is reinforced by the impetus for public participation, is that the local agencies are closer to the needs and desires of the people affected. State agencies will have to make adjustments that depend upon the regulations under which the regional programs are implemented. If the regional agencies are essentially independent of the state agency, then the impact upon the state agency consists of losing a part of its program. In other situations the state agency may be in a position of ensuring the quality of the local agency's work.

- Balancing of national objectives. Under this policy which is articulated in the National Environmental Policy Act, unavoidable environmental damage must be justified in terms of other national benefits. This justification is made public in an environmental impact statement which discusses, among other things, the range of alternatives that were considered in selecting the desired action. Many of the actions administered by state environmental quality protection agencies come under the requirements of the environmental impact statement process. Examples are new source permits and grants for municipal wastewater facilities under the Water Pollution Control Act Amendments of 1972. The implications of this are two-fold. The record of values established by the process can, in time, provide a new criterion of social acceptability for setting standards. Secondly, environmentally damaging actions that may not be permitted under existing standards may be allowed because of pressing national needs. Meeting future energy needs is a good example that began with approval of the Alaskan pipeline. Another example is relaxation of air quality standards in metropolitan regions for which highly unpopular transportation plans have been promulgated.

V FINDINGS AND RECOMMENDATIONS

The salient problem areas that emerged from the management review and functional analysis of the Environmental Protection Branch are identified and discussed below. The recommendations that follow from these findings are designed to provide alternative approaches for coping with these organizational issues.

Management Review Findings

1. The present organization is overly fragmented and this results in difficulties in coordination and internal communication between related programs and activities. The historical pattern of organizational growth is based upon the enactment of new legislation; new autonomous groups are created to cope with additional responsibilities assigned by the legislature. The proliferation of these groups over the years results in excessive redundancy and complexity. Other impacts on the organization are:

    - Similar responsibilities and duties are performed by several groups.
    - Involving appropriate personnel in interdependent organizational transactions is becoming more difficult.
    - Maintaining adequate communication between the numerous organizational components is time-consuming and costly.
    - Operating philosophies and field boundaries of the components brought together by the recent executive order reorganization are strikeingly different and present the possibility of "culture conflict."
    - The organization does not present a common face to its clients or to the general public.
    - New legislation generally affects several groups but activities associated with it are usually assigned to one specific group.
    - An integrated organizational thrust is not evident.

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2. New responsibilities are added to existing units without consideration of whether or not the required resources are available to perform the work. At best, resources tend to be late because of the characteristics of the budget cycle which are not usually congruent with the time-frame in which the work is allocated. Budget approval is based on considerations other than those related to work requirements. The new budgeting system (PBES) attempts to relate work programs with resources in the required priority sequence but thus far the new system is not well understood or accepted as an operating tool.

3. There appears to be little or no formal systems analysis or systems integration capability allocated to the Branch. There is a pressing need for this help in such areas as data processing, work flow analysis, paper work processes, integrated filing systems, and so forth. The vacuum that exists in this particular work sector raises questions about the adequacy of the information data base upon which important decisions are founded.

4. The general level of management sophistication within the Branch could stand augmentation. Basic management techniques and tools such as work planning methods, management by objectives, results-oriented performance evaluation, and so forth, are available but not applied. This condition lends itself to a management style that can best be described as "continual fire-fighting." It is apparent that individuals have been given managerial and supervisory responsibilities without receiving commensurate training in these important skill areas.

5. The operating posture of the Branch tends to be reactive rather than anticipative. A minimum effort is made to impact events before responsive action becomes mandatory. Thus far, the Branch has escaped serious consequences because of the following factors:

   - There are several well-qualified, highly motivated, competent individuals directing and performing the work in key areas of the organization.

   - There is acute sensitivity to the requirements and desires of key groups and individuals in the legislature and Commissions who have significant impact on the establishment and direction of the overall program.

   - The personnel, in general, as evidenced by those interviewed by the SRI project team are confident, knowledgeable, and willing to extend themselves to keep on top of the work load.

As changing legislative concepts and programs at both the Federal and State levels continue to make their impacts felt, pressures for corresponding changes within the organization will become more insistent. The present organization does not appear to be sufficiently adaptive to cope with these pressures. It is probable that if additional responsibilities were placed on the present operational structures, a diminution of effectiveness would occur. Rerationalization of present organizational and managerial concepts are the most promising avenue for favorable results.

6. Day-to-day decisions made by individuals at the technical and operational levels appear to be based upon personal estimates and best judgments of what the system requires rather than a body of policy guidelines developed to direct the operations of the organization. In the absence of a codified policy structure, decisions made may or may not reflect the values and best interests of the Branch or the Department despite the best of intentions. SRI's observations of the Branch's operations revealed the following:

- The role of policy in the conduct of Branch activities is not clearly understood.
- There does appear to be a general understanding throughout the Branch that policies are established by the:
    - Natural Resources Commission
    - Water Resources Commission
    - Air Pollution Commission
    - Director, Natural Resources Department
    - Deputy Director, Environmental Protection Branch
    - Chief, Water Management Bureau.
- There is no written reference available specifying the conditions under which policies are issued or guidance on the subject matter covered.
- There does not appear to be a formal system for:
    - Generating policies.
    - Organizing policies in a structured, documented format.
    - Specifying the organizational level at which the work will be performed.

- Providing a methodology for facilitating the retrieval of policy documentation.

- Providing a methodology for updating policies to meet changing conditions.

- Monitoring the actions taken to ensure that the desired results are obtained.

7. Management controls used in the Branch fall into three main classifications:

- Personnel Controls--Specified in budgetary and Civil Service requirements. To add a person to the payroll, a position delineating responsibilities and duties must be prepared, submitted, and approved. Also, the position and accompanying salary allocation must be provided within the budgetary procedure. This kind of control prevents the addition of excess personnel to the staff. Problems can result, however, when personnel are removed from the payroll once the specific need has been fulfilled. Although the possibility of carrying excess personnel exists, in reality it does not occur because of the rapid expansion of the Branch with corresponding increases in requirements for personnel.

- Budget and Expense Controls--The budgeting process now in use in the Branch appears to be a workable system. A flow diagram outlining the sequence of steps in the system is given in Figure 9. A possible shortcoming in the system, however, is the absence of a direct relationship between the amount of resources provided in the budget and the actual amount of resources required to accomplish the assigned work. The general process now in operation appears to be based on the assignment of new work to the existing organization when new legislation is enacted, while the provision of the resources to perform the work is allocated to subsequent budgets. Even then, the allocation of the required resources will be contingent upon the legislative urgencies of the moment. In short, the budgetary process tends to be more an accounting procedure than an effective management operating tool. Basically, the concept of the budget employed as an operating plan expressed in financial terms is not part of current management practice in the Branch.

- Program/Project Planning and Control--The primary evaluation technique employed in program/project planning is the Program Revision Request Systems. Little or no use is made of this system in the Branch. Most of the managers interviewed had never

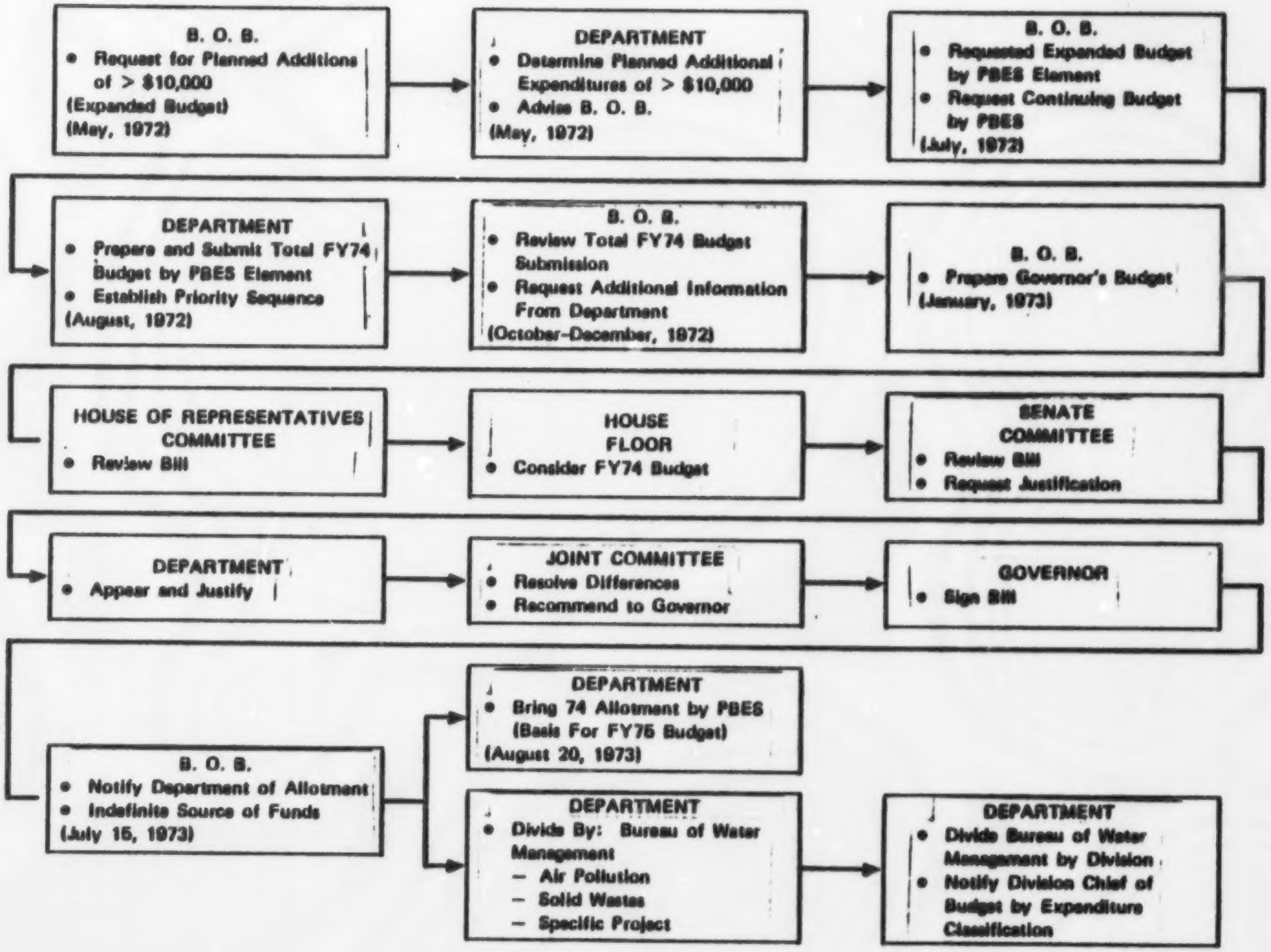
B. O. B.
• Request for Planned Additions of > $10,000
(Expanded Budget)
(May, 1972)
DEPARTMENT
• Determine Planned Additional Expenditures of > $10,000
• Advise B. O. B.
(May, 1972)
B. O. B.
• Requested Expanded Budget by PBES Element
• Request Continuing Budget by PBES
(July, 1972)
DEPARTMENT
• Prepare and Submit Total FY74 Budget by PBES Element
• Establish Priority Sequence
(August, 1972)
B. O. B.
• Review Total FY74 Budget Submission
• Request Additional Information From Department
(October-December, 1972)
B. O. B.
• Prepare Governor's Budget
(January, 1973)
HOUSE OF REPRESENTATIVES COMMITTEE
• Review Bill
HOUSE FLOOR
• Consider FY74 Budget
SENATE COMMITTEE
• Review Bill
• Request Justification
DEPARTMENT
• Appear and Justify
JOINT COMMITTEE
• Resolve Differences
• Recommend to Governor
GOVERNOR
• Sign Bill
B. O. B.
• Notify Department of Allotment
• Indefinite Source of Funds
(July 15, 1973)
DEPARTMENT
• Bring 74 Allotment by PBES
(Basis For FY75 Budget)
(August 20, 1973)
DEPARTMENT
• Divide By: Bureau of Water Management
– Air Pollution
– Solid Wastes
– Specific Project
DEPARTMENT
• Divide Bureau of Water Management by Division
• Notify Division Chief of Budget by Expenditure Classification

FIGURE 9 BRANCH BUDGET SYSTEM

used the system nor were they familiar with its purpose or methodology.

8. The use of documented procedures does not appear to be widespread in the Branch. SRI team members found only limited instances of sound documentation in existence. Much of the Branch's fund of technical, operational, and administrative know-how is carried around in people's heads. This situation poses serious problems to the Branch in the event that key individuals die, retire, or decide to leave the employ of the State. The lack of a commonality of procedural knowledge leads to excessive specialization with the resulting reduction in opportunities for career growth and advancement. The Branch appears to have too heavy an investment in particular individuals and too little emphasis on a data base of documented procedural knowledge or a practical system of personnel backup.

9. In general management practice, establishment of work priorities is related to:

   - Management's identification of those areas considered vital to accomplishment of the organization's missions and objectives.
   - Classification of those work areas in terms of relative importance.
   - Optimum deployment of resources such as people, money, technology.
   - Difficulty in performing the various tasks.
   - Knowledge and skill available to perform these tasks.
   - A plan for implementing the selected pattern of choices.

   It is not readily apparent that work priorities within the Branch are based on a systematic consideration of the above factors. Top priority appears to be given to those legislative pressures which require the shortest response time. A legislative act specifying response actions within 30 days is usually given priority over an action required within a 60-day period, regardless of when the work request was received. In those cases where a definite response time is not specified, it is likely that these pieces of work will receive low priority and be delayed or not completed for an extensive period of time. The observations of the SRI project team indicate that the setting of priorities within the Branch is generally left to the discretion and judgment of the Section Manager.

10. Performance appraisal has been traditionally used by management to compare the contributions of individuals or groups and hopefully provide an objective means of justifying salary or promotional actions. The performance review process is also regarded as an opportunity to motivate employees to improve their performance. Recent advances in management practice have drawn attention to some of the more systematic uses that can be derived from this tool:

- Integration of organizational objectives with the individual's own personal goals and aspirations.
- Assignment of individual accountability and correlation of this accountability with work flow and unit responsibility.
- Identification of program needs.
- Identification of technical training and personal development needs of individuals and groups.
- Identification of individuals having potential and talent.
- Personal counseling and career development.

The recent review of management practices made by the SRI project team revealed that the use of the appraisal tool is not fully utilized. Present practice appears to consist of:

- Mandatory performance appraisals conducted at the end of the third and sixth months after an individual is employed or changes jobs.
- Performance appraisal can be conducted at other times to draw attention to either outstanding or substandard performance.

11. There are three functional areas of planning that are applicable and useful for facilitating the operational efforts of the Environmental Protection Branch. These can be categorized as:

- Strategic Planning--The development of the conceptual framework for defining the essential character and posture of the organization and providing the guidelines for allocating resources and structuring the programs and activities for achieving the desired goals. The strategic planning function also serves as the mechanism for dealing with uncertainty and change by determining the internal conditions required for adaptation to external realities.

- Operational Planning--The programmatic framework that determines the sequences and schedules the significant activities, processes, and events required to efficiently implement the organization's goals and strategies. This particular aspect of planning is primarily concerned with such internal processes as budgeting, time/cost relationships, formulating decision rules for operational control, and appraising, measuring, and influencing management performance so that the desired results set forth in the strategic plan occur as projected.

- Preparation of Plans and Programs Required by Law--This kind of planning is in response to Federal and State laws and regulations requiring continuing planning for relating resources to programs and services for achieving desired states of environmental quality.

The planning activities observed in the Branch appear to be primarily oriented to the preparation of plans and programs required by law. Other types of planning were not readily visible possibly because:

- Strategic planning as an organizational and managerial concept is not well understood and has not been practiced in the past.

- Operational planning is more familiar but most individuals interviewed were too busy coping with the day-to-day pressures to make the time investment that systematic planning requires.

- The prevailing mode of operation is to work one's way out of problem situations by reacting to events as they occur rather than anticipating probable occurrences and making provisions for coping with them.

12. The information needs of the Branch can be divided into two main categories, management information and technical operations information. The following concept has been developed as a framework within which the Branch can view its information needs in relation to its goals and purposes. This concept was used as a basis for appraising the present information activities.

    - Management Information--Data categorized under this heading are designed to fulfill management's need to provide effective decision-making capability at all organizational levels. To accomplish this purpose, people, equipment, and procedures must be arranged in such a manner that information related to the Branch's present and future operations can be systematically collected, processed, and analyzed in a reliable and timely manner. When this function is effectively performed, managers are better able to make decisions designed to optimize the efficiency of their operations and to control the direction and scope to conform to the intent of those decisions. To accomplish this objective, it is necessary to receive management support in the following areas:

- Data Collection--Information related to planning, resource management (people, money, and facilities), costs control, time and activity reporting, and work status in respect to schedules and performance.

- Information Analysis--Requires the capability to aggregate collected data in accordance with program and process needs and relate these variables to organizational effects.

- Information Dissemination--Effective management performance at all organizational levels depends on the receipt of relevant information that is timely, accurate, complete, and in the proper format.

- Technical Operations Information--Data collected under this heading are organized to support the diverse functions involved in managing environmental quality. The key functional processes comprising this activity are:

  - Adopting, maintaining, and updating environmental quality goals, objectives, criteria and standards, and policy guidelines.

  - Using the appropriate technical processes and environmental management actions required to support the achievement of environmental goals.

  - Organizing authorities and responsibilities for the environmental quality management program.

  - Conducting monitoring, evaluation, and reporting programs to support the technical operations.

  - Allocating resources to the various organizational elements to support their authorities and responsibilities.

  The technical operations information system is most directly related to the organization's monitoring, evaluation, and environmental status reporting programs. An effective information system should (1) provide feedback for process control, (2) establish an environmental quality baseline and record historical trends, and (3) provide outputs that contribute to the understanding of the relationship between environmental resource use and the corresponding effects. Ideally, a technical information system should be structured around an environmental concept model which has the capability to describe the interrelationships between human activities, the resulting environmental effects, and their socioeconomic consequences. Such a system would enable management to visualize how environmental quality management decisions and interventions would affect the interrelationships between system variables in accomplishing selected goals. It is recognized that in any specific situation the scope of management actions may be relatively limited and the information may also be constrained. A possible environmental concept model--An Environmental Effects Framework--is described in the discussion of Technical Operations in this chapter of the report. Under such a system, information would be processed in the following manner:

- Data Collection--Data would be required by various means ranging from counts of activities or transactions, samples of emissions, discharge and environmental media, instrumental measurements to synoptic monitoring by remote sensing. In gathering this data, critical concerns would be:

  - Accuracy--How well do the results represent reality?
  - Validity--To what parameter (geographic, volumetric, mass, or population limits) does the data relate?
  - Perishability--For what period of time is the data valid?

- Data Management--This includes those activities that facilitate input, validation, retrieval processes, and other transactions with the data base. For example, when the information analysis function (see below) requires data, the appropriate index is interrogated and the requested data is retrieved and provided for the completion of the analysis.

  As data enter the system and reports are generated, it may be necessary to convert both the format and the medium, i.e., data may have to be keypunched or computer output may need to be placed on microfilm for storage, and so on. As the data base is expanded, the index files and cross-reference linkages must be updated to enable the required pieces of data to be located efficiently.

- Information Analysis--The basic querying process of an environmental information system relates a source of emissions to the environmental effects in proportion to the influence exerted by the control actions. In answering any specific questions, something unique must be stated or assumed about the source, thus enabling either the control factors or the effects to be determined as a function of the other. Such questions can be stated directly or in an inverted form. The information system should have the capability of classifying and processing data so that the information needs (in the form of user questions) of the Environmental Protection Branch can also be met in terms of cost/effectiveness.

- Information Dissemination--Many information system users require periodic responses in a fixed format. Other users are interested in reports only when certain conditions are made manifest by an analysis of the data. The information system should be able to respond to both types of requirements.

SRI's analysis of the Branch's information processing and data management capability based on the above discussed concept revealed the following:

Management Information

- Most of the managers interviewed do not give sufficient thought to the problem of what information is needed to operate their part of the Branch.

- In the early stage of the study, several key managers retired; in some cases their successors were not in a position to define their information needs.

- Most section managers rely on their daily involvement in the work and their personal understanding of the work flow processes to keep themselves informed about the work in progress and to identify problems as they arise.

- Division chiefs tend to rely on section managers to keep them informed about potential problems. Little reliance is placed on status reports or information flows.

- Managers in the Branch believe that all required information can be made available when requested but such an effort would divert attention from other ongoing activities.

- If planning is omitted or delegated to lower operating levels, managers will tend to find limited use for management control information.

Technical Operations Information

- Information related to technical operations is oriented toward a specific number of special purposes. Primary emphasis tends to be placed on enforcement data and only a weak secondary interest is shown in environmental management data.

- There is more emphasis placed on data gathering as opposed to data manipulation. More information utility can be derived from the existing data base.

- Restructuring present data programs to fit an environmental management concept could result in a better cost/effectiveness ration.

- Present data systems have limited dissemination and utilization outside of the Environmental Protection Branch.

- The present data system cannot relate environmental quality improvement to the costs and benefits generated.

- The water quality data system is limited to WISE which is enforcement oriented and STORET which is primarily used in archive capacity.

- The air quality data base still is in a relatively rudimentary state.

- There is no solid waste data base to use in systematic monitoring or environmental management.

Systems Definition, Systems Design, and Work Flow Processes

- Very little emphasis is placed on a systematic conception of work flow.

- The work flow concept and methodology are generally left to the discretion and judgment of the section manager.

- The Branch does not appear to place any great reliance on formal delineations of work flow such as flow charts and other visual methods. Work flow is essentially an intuitive process in the section manager's head; in some instances, work flow tends to be defined by procedural instructions contained in sections of the laws.

- Systems analysts are not readily available to assist section managers in defining and designing the systems required to perform the section's work.

Data Processing Support

- Basic support in data processing is provided by the Highway Department.

- Access to the Michigan State University computer is available through terminals.

- Hardware used for data processing is adequate but control of schedules and response time to problems and priorities is out of the Branch's hands. Decisions regarding these important factors are made by non-Branch management.

Common Files and Information Retrieval Capability

- There is much uncertainty regarding the timeliness, accuracy, relevance, and completeness of information contained in Branch files.

- The Hydrological Survey Division is presently considering the establishment of common files and retrieval processes for their division.

- Systems analysis support to develop manual or mechanized filing and retrieval systems is not available.

- Efforts directed to this area to alleviate problems that emerge require diversion of attention from other work activities.

Management Review Recommendations

The following recommendations incorporate the full range of findings reported above and seek to integrate constructive measures for coping with the dysfunctions and difficulties observed in the various operational areas of the present organizational alignment. It is apparent that the Environmental Protection Branch, if it is to successfully perform its missions, must be structured in such a way that its internal processes can make full use of new evolving technology and modern management methods and can effectively employ the wide spectrum of technical and management skills available in its talented work force. This organization must also be capable of performing the various organizational tasks in a more flexible and responsive manner to take full advantage of new opportunities or to adapt to conditions imposed by its environment. This capacity to deal with change will enhance all aspects of organizational performance. To achieve desired results in organizational and operational effectiveness, efficiency, and services, major changes in functional relationships will be necessary in all areas of Branch operations.

Based on the management review findings, the SRI project team recommends the following measures for bringing the observed difficulties under control.

> Establish a centralized planning function that would include provisions for (a) strategic planning, (b) operational planning, and (c) preparation of State environmental programs required by law.

This step would facilitate management control of ongoing operations by determining in advance:

- Areas of significant resource expenditure.
- Situations requiring close management scrutiny and monitoring.
- Mechanisms for ensuring that organizational priorities will be implemented.
- Operational mechanisms for linking planning objectives with day-to-day activities.

A centralized planning function would then provide the means for defining the basis of operations for those responsible for accomplishing the organization's purposes. Programmatic aspects of the planning process would be responsible for informing management whether or not goals have changed, schedule slippage has occurred, costs have risen beyond original projections, or other variant conditions have surfaced within critical organizational processes. Such a function would also serve as an essential communication link tying together the various functional processes and resolving conflicting viewpoints into a unified focus for action as well as ensuring that all internal programs, activities, and services support the organization's goals, missions, and objectives.

Assign to the planning function responsibility for defining and developing objectives, determining alternative means for accomplishing these objectives, and providing mechanisms for changing or modifying objectives and communicating these changes to appropriate levels in the organization.

This function should also be given the responsibility for determining the level of resources required to achieve these objectives and for developing the policy framework needed to regulate the acquisition, use, and maintenance of these resources. As part of its responsibility, the planning function would be responsible for establishing a formal system for issuing, codifying, controlling, and updating policies, regulations, and procedures.

Analyze and systematize the Branch's internal work processes.

This function is necessary to accomplish the following:

- Develop a work flow system that will integrate related work activities, avoid redundancy and duplication in function, and clearly delineate task responsibilities within each organizational component. Rules and procedures should also be developed and documented for each task to be performed.

- Review annually position descriptions to determine whether or not actual responsibilities are adequately reflected in the work being performed. Descriptions should not only define each individual's role behavior in respect to task demands but also provide that individual with information about the role expectancies of other individuals performing interrelated tasks. Within these descriptions, accountability should be specified in terms of:

    - Discretionary areas of decision making
    - Decisions outside of one's area of discretionary action
    - Referral procedures in those cases where authority is withheld.

- Develop communication channels for quickly transmitting information required by each pattern of interrelated tasks. This communication network should provide sufficient information for facilitating decision making and also provide each individual with the means for accurately assessing the consequences of his decisions.

- Enable division managers to establish work priorities for each section and monitor the work flow to ensure that Branch guidelines are implemented. Priorities should be set only by those with the authority to influence resource allocations and judge the relative merits of the various requests for service.

- Institute as quickly as possible active use of the PBES system as a management tool. This system offers an effective methodology for subdividing the work process by major work elements, determining the resources required, and presenting this information in priority sequence. The system also appears to be an effective method for justifying budget requests.

- Establish a systems analysis group within the Branch to assist managers with problems related to work flow, work simplification, methods and procedures, and data base design, development, and management.

Establish a program development unit as a Branch staff function.

This new unit would perform the following activities:

- Evaluate new responsibilities assigned to the Branch in terms of the resources and capabilities (money, technology, people, special skills, and time frame) needed to transform legal requirements into ongoing operational procedures.

- Obtain the necessary resources required for performing preliminary studies and developing the pilot program.

- Conduct functional analyses of the new program in terms of component subsystems in the Branch and determine their interrelationships.

- Implement, monitor, evaluate, and modify the new program prior to placing it on an operational status.

- Turn over the new program to the designated organizational component for inclusion into ongoing Branch operations.

Establish an organizational unit that centralizes all information processing activities performed in the Branch and that would include provisions for developing and managing (a) a management data system for augmenting management decision-making capability and (b) a technical operations data system to support the technical functions involved in managing environmental quality.

This component would be assigned the following responsibilities:

- Developing and implementing systematic data collection procedures, supporting data processing equipment, and coordinating operational systems.

- Developing uniform user procedures for all information processing activities in the Branch.

- Designing, developing, and implementing information processing systems which would include integrated common files and an information retrieval capability to permit sophisticated analysis and manipulation of data bases supporting managerial functions and technical operations.

- Providing Branch operations with technical support in the areas of systems analysis, system design and development, data processing, methods and procedures, and data management.

Technical Operations Findings

The SRI assessment of the technical operations of the Environmental Protection Branch is presented in terms of the Environmental Protection Concept discussed in Chapter IV.

13. Predicting the effects of an action. This is the basic function of evaluating permit applications. The evaluation criteria are established by law and are usually expressed as physical, chemical, and biological standards, or as technical processes. In a few cases the priorities for permit processing are assigned by law--e.g., NPDES--however, they are generally established by the evaluator. The permit application processing is handled in its entirety by the organizational element to which the responsibility is assigned. There is no institutionalized process for reviewing

applications for intermedia impacts. The evaluation is very much dependent on the evaluator's knowledge base and to some extent on his work load. In only a few cases has the process been standardized against a computational model and an organized data base. Nevertheless the work is generally competent and fair. The function is presently understaffed in most major areas. The NYPDES program is likely to add a large burden to the Water Resources Commission Staff. However, the Air Pollution Control staff is approaching the status of a maintenance agency.

14. Surveillance of the action. Surveillance (as opposed to monitoring) is generally in need of improvement. There is a need to strengthen follow-up to permit authorization; also, a strong systematic intelligence function is needed to detect unauthorized actions. Operators of stationary air pollution sources, and wastewater and sewage treatment facilities submit periodic reports on emissions but there is insufficient independent surveillance of these operations to deter would-be violators. Public complaints are relied upon but the process is neither facilitated nor encouraged.

15. Monitoring the effects. Monitoring is approached more from the enforcement perspective than from an environmental management point of view. Nevertheless, the coverage of air and water physical, chemical, and to a lesser extent biological quality parameters is good. The coverage of those parameters that define the resource and the characteristics that describe its potential for various uses including assimilation of wastes is only fair. Coverage of parameters that define potential demand for uses and describe the impacts of the extant uses of public health, welfare, and other relevant socioeconomic characteristics tend to be poor and nonexistent. In general, the enforcement viewpoint of monitoring is certainly adequate for State implementation of Federal programs. The State's monitoring programs are supported by an effective surveillance fee program, but this tends to reinforce the enforcement approach. The routine support provided by the laboratories has been adequate. Up-to-date maps displaying hydrological characteristics (including delineation of flood plains) as they are affected by development and other activities are not presently being maintained.

16. Special studies. Studies to develop procedures or to evaluate unique environmental problems are regularly conducted by the staff and occasionally by a private contractor. The State universities are seldom used for consulting purposes although individuals from

the academic community occasionally serve on advisory boards. The studies conducted by the staff examine well-defined problems that must be addressed but seldom are of an exploratory nature to discover incipient problems. The press of everyday enforcement work usually receives priority over study efforts.

17. Planning. Planning is conducted in response to State legislative mandates. It is generally performed in a reactive mode but is very competently done. However, there does not appear to be a directed effort to establish objectives or select a course of action from among alternatives to influence future directions.

18. Public participation. Public participation as practiced in Branch operations consists mainly of open hearings conducted by the commissions. At one time, this approach was considered to be quite progressive but the present conditions under which the Branch now operates requires further rethinking of this important interface. The current philosophy of the agency places the onus on the public for initiating its participation. Generally speaking, this process as it becomes institutionalized can, with some adjustments, meet Federal requirements for State implementation of Federal programs. It will not, however, without a fundamental shift in philosophy, be responsive to the evolving spirit of the requirements.

In responding to the challenge of public participation, field representation of the Branch can play an important role in performing this function. The field representatives have a good public image. They are viewed by those with whom they interact as competent, fair-minded professionals who are responsive to local needs.

If the public participation function is to be performed effectively, it must develop a cooperative sharing relationship with regional and local entities. The agency has made some positive strides in this direction but has not as yet built this capability into all of its programs.

19. Technology acquisition. Technology acquisition is primarily the responsibility of the individual. He is expected to maintain technical competence commensurate with his job responsibilities. There are limited training and orientation programs in some of the organizational elements; in others, individuals are designated as focal points for maintaining currency in particular technical specialties. There is no formal program of job rotation to enhance career development. Neither is there a formal educational program leading to advanced degrees or to a broadened perspective. There is little

day-to-day interaction with the nearby academic institutions regarding technical problems. Because of limited resources, consultants and contractors are used to handle work overloads rather than acquisition and application of new knowledge, methodologies, and concepts. The salary scale and available career opportunity should attract the advanced degree graduate, but there is no directed program to recruit these individuals. Despite this state of affairs, the work is being accomplished in a technically competent manner. This suggests that the individuals are remaining current on their own and that the technology is not presently changing at too rapid a rate.

Technical Operations Recommendations

The following recommendations are based on the findings reported in the previous section. It is recognized that the Branch may be institutionally constrained from implementing some of the proposals.

Consolidate the separate permitting processes in the Branch into a centralized system that would allow the paperwork associated with these applications to be handled in a logical, efficient manner.

Such a system would include a single point of contact for all communications related to applications and their status; a common policy for establishing processing priorities; intermedia and interagency review and coordination of applications; utilization of common data bases and methods of evaluation; delegation of certain responsibilities by the commisions in the form of rules and regulations that can be uniformly applied; and subprofessional support for all processing functions except those requiring professional judgment. This recommendation does not circumvent the Commissions' responsibilities for generating policy or approvals assigned under law; it refers solely to the paper work processes that accompany Commission actions or preparations for Commission action.

Establish a schedule of surveillance activities as a part of the permitting process.

These schedules would be entered into an information system that would publish a periodic statement of requirements, accept reports of surveillance activities and complaints, and publish compilations of the results including exception reports for missed activities and activities in apparent violation. This recommendation in effect would extend the Branch's WISE system concept to all permitting activities.

Regional telephone numbers, differentiated from regular business numbers, should be established and publicized for public use in making complaints. The complainant should receive a report of the action taken.

Distinguish institutionally the purpose of monitoring for enforcement from the purpose of monitoring for environmental resource management.

The above recommendations relative to surveillance will further this objective. However, it is important that the environment be viewed as a resource that is valued for different purposes by different interests. Since many of these purposes are conflicting in terms of their environmental quality requirements and effects, it is the purpose of environmental resource management to set priorities and regulate uses consistent with a level of environmental quality. Monitoring should provide the information necessary for management decisions and should demonstrate how effectively this is being done. It should, therefore, include information related to the demand for various uses, the actions taken to control uses; the uses and their physical, chemical, and biological effects; and the impacts of these effects on ecological and socioeconomic systems. Accordingly, it is recommended that an environmental monitoring system be established around a predictive system concept encompassing these elements. The system should have the capability to develop a baseline, trends, correlations, and functional relationships, and to display up-to-date resource use demands and patterns, environmental quality conditions, resource characteristics (including flood plain delineations), and socioeconomic impacts. Much of the nonenvironmental quality information will be available from other governmental agencies. The system will provide a logical statewide focal point for remotely sensed date.

It is recommended that the laboratory support be rationalized in terms of procedures and determinations rather than the sample media. These determinations and procedures should use instrumental methods where available and cost-effective. The use of other state laboratory facilities and private laboratories should be evaluated for specific routine determinations. The laboratory should develop the capability to conduct special studies and to develop analytical procedures.

Use of special studies to (1) support State environmental quality goals and objectives, (2) acquire new technology and perspective, (3) continue to build a national reputation of scientific and technical excellence, and (4) build credibility with the State's constituents.

Special studies should be undertaken on subjects that have been identified in the planning process as critical issues. The studies should be designed to frame the findings in terms of management procedures and options. Much greater use should be made of academic investigators and consultants but with active participation of State personnel. Contractors and consultants should be used to give credibility to controversial issues.

Establish a centralized planning function.

This function should establish objectives and goals, define critical issues, evaluate alternatives, and adopt a strategy for achieving the goals and objectives. This central planning function will coordinate and integrate the planning efforts of the various organizational elements.

Give the public participation function an organizational focus.

This is not the kind of focus that presents the official organizational face to the public, but rather one which defines needs and integrates and coordinates the activities of the Branch in this regard. As part of this activity, periodic information sheets should be prepared on Branch activities and status of actions for distribution to interests, the media, and the general public. From the viewpoint of effective public participation, it is recommended that the field operations of the Branch be strengthened and consolidated. The representatives of various organizational elements should respond to common geographic areas and should share common office space in that district. One of the representatives should be designated the senior representative, the office manager, and the spokesman for the Branch in that district. The public should be encouraged to make contacts with the Branch through this senior representative. The establishment of a strong and effective field force may reduce some of the pressure for delegation of powers to regional and local entities. However, even when the powers are delegated, the State's presence should be made evident either to back up the local authority or to take over if the local authority fails to meet its responsibilities.

Implement a program of technology acquisition for all the specialists of the Branch's technology base.

If the previous recommendations are implemented, the Branch will acquire a changed concept of its purpose, objectives, and scope. This will require a broadened technological base. This will include specialties such as sociology, economics, remote sensing, urban and land use planning, and systems engineering. However, more importantly, generalists should be created by a planned program of exposure to different work assignments. These should include different technical areas, different functional areas, and different geographical areas. This should be a part of a career development program for those individuals identified as potential managers. To acquire the technological bases, a program must be implemented in all of these specialties of the technology base. This can include:

- Hiring qualified people—experienced in new technologies (if available) or new degree holders who have been exposed to the latest concepts in university research.
- Training existing employees—courses and seminars by visiting lecturers specifically for staff; closed circuit TV courses from the universities; time off for course work at universities; and participation in advanced degree programs.
- Sponsorship of contract research in advanced areas, with participation of staff on research teams.
- Strengthening of laboratory to include capabilities to conduct special research studies.
- Formation of boards of advisors to evaluate specific technical problems or to review the technical performance generally.
- Formation of a technical library including standard references and journals and an aggressive program of acquisition of pertinent technical reports.

Manpower and Personnel Findings

Today, as never before, managers are compelled to make the fullest possible use of human resources. The increasing size of organizations, changing social values, increasing economic affluence, and the emergence of new managerial technologies have swept us into an era of unprecedented change. Effective use of available talent has become a principal operating imperative for even the smallest of organizations. Refusal to recognize this fact of life runs the risk of imperiling individual and group productivity as well as commitment to organizational goals. When individual needs and values collide with the requirements of organizational efficiency and effectiveness, the resulting decrement in motivation and morale, not to mention the stifling of initiative, imagination and personal growth, can lead to situations in which both individuals and organizations fall short of meeting their basic goals. This appears to be a common problem in government and industry today.

Fortunately, managers are becoming increasingly aware that organizations must provide a humanistic climate that can meet each individual's needs for personal satisfaction and realization of his own potential and goals. This recognized need for the organization and its membership to be congruent is a fundamental tenet of modern managerial practice.

A review of manpower programs related to Branch operations revealed the following areas of concern:

20. There is no systematic process for determining future manpower requirements or to assess the capability of existing manpower resources to meet these requirements, or framework for developing action programs to solve existing or anticipated manpower problems.

21. An employee information system which provides ready access to data about employees' personal and experiential characteristics is not available.

22. A formal personal training and development program designed to meet Branch needs for technical, supervisory, and managerial personnel does not exist. Some training is provided by the operating divisions and Civil Service sponsors a limited number of training courses for supervisors and managers. The organization has grown rapidly, new personnel have been added, and significant changes have occurred in all sectors of the work environment; yet, no systematic effort has been made to upgrade the human resource capability.

23. The employment process is lengthy and cumbersome. Filling vacant positions has sometimes taken over three months to accomplish. Operating supervisors believe the time span for filling vacancies is excessive but are uncertain about what recourse is available for solving staffing problems. The gap between the operating groups and the staffing practices of the Civil Service Commission causes frustration and breakdown in communications.

24. Civil Service wage administration policies provide basically the same increases in salary for the average performer as for the outstanding performer. This is not unusual in government service salary practice. However, it does point out the need to seek other rewards or incentives for the exceptional employee.

Manpower and Personnel Recommendations

The following recommendations are directed toward assisting the Environmental Protection Branch in upgrading its manpower practices. Because much of the responsibility and authority for personnel practices is vested outside the Branch, the suggested approaches permeate and intertwine with the functional responsibilities of the Personnel Division, Department of Natural Resources, and the Civil Service Commission. The development of an effective manpower program will therefore require substantial agreement and understanding of the organizational requirements of each of these entities to provide an appropriate division of responsibility for enabling the Environmental Protection Branch to fulfill its needs for operational effectiveness by making available the necessary resources to meet its objectives and goals.

Based on manpower and personnel review findings, the following recommendations were made for improving the present programs.

> Establish a manpower planning system that provides for (a) an employment function, (b) formal training and development programs for inside staff as well as local agency personnel, (c) effective manpower utilization programs, and (d) a methodology for achieving efficient manpower resource allocations (see page 91).

The employment function is concerned with the numbers, kinds, and quality of people recruited, selected, hired, and placed in their initial assignments. Training and development programs are designed to maximize the skills and potentials by providing opportunities for individuals to upgrade their capabilities and prepare themselves for career advancement in the organization. These programs should also include continued and increased use of Federal grants to support local agency personnel training and development. Manpower utilization focuses on the effective use of personnel in terms of the appropriate structurings of roles, tasks, and work processes. Effective organization of work increases the probability of a good fit between the person and his job and reinforces the individual's performance and motivation. Manpower allocation covers the proper movement and balance of talent through transfer, rotation, and promotion and ensures the most effective use of manpower resources in the organization.

This step would enable the Environmental Protection Branch to link manpower planning with its strategic and operational planning efforts and derive the human resource implications related to its missions, programs, and diverse technical activities. The manpower planning system will also be used to support local pollution control agencies.

Develop a performance system that goes beyond meeting just the minimum standard of the Civil Service Commission.

This appraisal system should be attuned to the needs of the employee and the goals and objectives of the Environmental Protection Branch. It should be one that not only measures an individual's contribution, but one that motivates the employee to improve. Recent advances in this management practice have drawn attention to some of the more systematic uses that can be derived from this tool. These are:

- Integration of organizational objectives and the individual's own personal goals and aspiration.
- Assignment of individual accountability and correlation of this accountability to work flow and unit responsibility.
- Identification of program needs.
- Identification of individual and group technical training and personal development needs.
- Identification of individuals with potential and talent.
- Personal counseling and career development.

Develop an employee information system to provide the necessary data to facilitate the workings of the management process.

In order to accomplish this, it will be necessary to examine present methods for generating information on employees, identify current needs and future needs based on manpower planning, and determine what information is available through the Department and Civil Service Commission. Then the plans for the system can be developed and the system can be implemented.

Intergovernmental Process Findings

The following findings were developed through interviews with staff members of the Environmental Protection Branch and discussions and interviews with persons outside the Branch. These findings are based on the emerging needs for intergovernmental process program elements both within the State and between the State and the Federal government.

25. Michigan has 83 counties, 522 municipalities, 1,253 townships, and 1,145 school and other special districts served by approximately 23,074 elected officials.* The Branch lacks a comprehensive set of policy statements and procedures to govern the relationships with these various units of government. Both field and headquarters staff deal with local units of government on a case-by-case basis; these experiences and precedents are not systematically retained and Branch staff is given no guidance in applying rules and regulations.

26. There is no single identifiable source within the Branch to which a local governmental authority can go to determine the status of actions affecting his jurisdiction. An action, once started, must be pursued through the agency on a personal contact basis.

27. Different actions concerning the same local jurisdiction or jurisdictions are handled by different sections and personnel within the Branch. Coordination is a matter of personal initiative and the lack of a formal mechanism for achieving appropriate linkage leads to interpersonal tensions and misunderstandings between Branch field staff, headquarters staff, and local authorities.

28. The Branch is unable to identify the intergovernmental activities within its organization because there is no express distinction between an action under a categorical program--such as the submittal of a grant application for waste treatment facilities--and the intergovernmental processes involved in that action--such as the actions required by local and/or regional government and the Federal government with respect to the application. Thus, the Branch is unable to account for the allocation and expenditure of resources to attend to the intergovernmental aspects of its work.

29. Responsibility for developing new State programs in response to State legislation is divided and scattered. As a result, the intergovernmental aspects of such programs lack systematic development.

30. There are 119 points of staff contact within the Branch which have 198 points of contact with staff in 12 agencies, departments, bureaus and commissions in the Federal government; these contacts involve some 31 categories or program activities. While a majority

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*Some municipal and township officials also serve county governments; the total has been adjusted to remove duplication.

of these contacts involve the processing of routine matters, there is no centralized activity within the Branch that is responsible for coordinating these intergovernmental activities and there is no point where responsibility rests for systematically developing and maintaining State policy on the Federal-State aspects of the Branch's work.

31. As the result of passage of The Clean Air Act of 1970 and subsequent Amendments, recent judicial decisions interpreting air quality statutes, and other decisions at the Federal level, there has been a substantial increase in the number of proposed and final regulatory actions by EPA. Included in these regulations are dozens of actions that affect the work of the Branch and/or some major interest in the State. Proposed regulations require a detailed analysis and assessment as to their impact on existing programs, State law and regulations, interests within the State--both governmental and private--and the preparation of responses. The Branch lacks a systematic data base from which it could determine the impact of proposed regulations on the interests in the State and a systematic, informed methodology for conducting such assessments.

32. Federal statutes, rules and regulations require socioeconomic projections, cost-benefit determinations, demographic projections, and impact analysis in connection with the Branch's obligations in meeting specific program requirements. Many of these requirements must be met for regional or local jurisdictions. The Branch neither has the capabilities to carry out these types of requirements nor to communicate and, when applicable, negotiate them effectively with the local units of government.

Intergovernmental Process Recommendations

These recommendations go beyond acknowledging that establishment of appropriate intergovernmental processes within the State are an expressly required element of some Federal environmental protection programs. They address the Branch's growing need to deal with the complex, interdependent and interrelated technical, institutional, legal and regulatory, economic, financial, and social aspects of all environmental protection programs within the State as they bear on the conduct and regulation of affairs between the Branch and other units and levels of government. The recommendations will require changes in the Branch's functional responsibilities and relationships. But beyond the internal organizational realignments required to implement these changes, the recommendations will require new ways of perceiving tasks within the Branch and the development of shared and cooperative perspectives towards the organization's intergovernmental activities in environmental protection.

A successful intergovernmental affairs program depends upon the development of a careful, sympathetic, and realistic perception of the aims, positions, needs, and political and legal responsibilities of other governmental interests involved, and the formulation of a strategy that will take these factors into account in institutionalizing new and changing programs with the governmental units affected.

The task of developing such a program will be difficult. It will be complex because different governments will have different relationships with the State over different issues and time frames. It will be uncertain because the specific interests affected will be different at different stages of each program's development and execution. It will be dynamic because there will be legislative and regulatory adjustments over time to existing environmental programs, as well as new programs added at both the State and Federal levels of government. The intergovernmental aspects of environmental protection will require imagination, foresight, and sound reasoning on the facts involved because many of the actions that will be required lack precedents or useful analogies. The area will produce substantial intergovernmental conflicts because law and regulation will require adjustments to the scope and authorities of various governmental entities for specialized purposes.

The following recommendations were developed to address the problems being encountered by the Branch in the intergovernmental process area and to take advantage of the opportunities they present for enhancement of the Branch's operations.

Establish an organizational component within the Branch which is responsible for intergovernmental affairs, and assign to this component the responsibility for developing and conducting an intergovernmental affairs program for the Branch.

Included in this recommendation are the following responsibilities which should be assigned to this component:

- Require the component to include in its program the development and maintenance of a systematic and comprehensive data base of local, regional, federal and international intergovernmental process impacts, requirements, needs, and problems.

- Delegate to the component responsibility for assessing new and proposed laws and regulations with respect to their impacts and program requirements in the intergovernmental area and for developing policy with respect to such.

- Designate the component as the central coordinating point and clearinghouse for all of the Branch's actions which involve aspects of the intergovernmental process, such as the processing of grant applications.

- Require coordination of the Branch's planning and operational activities with the intergovernmental component to assure that intergovernmental needs, requirements, interests, and perspectives have been accounted for in the development of long-range and operational plans.

- Direct the intergovernmental component to provide support to the Branch's field services for special problems and situations involving intergovernmental matters.

- Assign to the component, as agent for the Deputy and, where applicable, the Director, the responsibility for official representation on liaison with all interstate, international, national and other commissions, committees, boards, panels, and the like. In this connection, assure that the component is responsible for assuring that the interests and duties of the other elements within the Branch are adequately represented, including attendance by the appropriate personnel within the Branch where applicable.

- Charge the component with the responsibility for developing, in cooperation with other elements within the Department and agencies within State government, the socioeconomic, demographic and related impacts of the Branch's present and proposed programs as they relate to governmental decisions.

Stakeholder Processes Findings

The findings presented below are based upon an analysis of SRI interviews with members of the Environmental Protection Branch and representatives of interest groups throughout the State of Michigan:

33. Little formal recognition of stakeholder interests exists within the Branch. Consequently, there is no management provision for objective assessment of the various interest positions nor is there any systematic means for relating such claims to ongoing policies and programs, or determining the areas of consensus and difference between the groups.

34. The Branch has not developed a systematic methodology for determining the critical issues and actions of interest to the various stakeholder groups and disseminating pertinent information to the public and the interested special groups. Communication channels that do exist are fragmented and dispersed among the various components and individuals in the Branch.

35. Individual staff members do develop relationships with interest groups in regard to specific issues, programs, and actions but the Branch does not possess a systematically developed policy framework to guide staff members in the development and conduct of these transactions. The end result of this condition is that the interest groups often find the Branch's policies, decisions, and actions inconsistent and confusing. Categorical programs such as air, water, and solid waste as well as the different components and levels in the Branch tend to project differing views of organizational reality.

36. The Branch does not systematically develop an informed constituency of stakeholder interests in regard to emerging or pending issues that contain potential for public controversy. Stakeholder positions are apt to develop fortuitously or depend on individual initiative to develop information and expertise relevant to the issues. Effective effort in this area can facilitate the formation of public consensus on critical issues thereby reducing abrasive and disruptive controversy.

37. By law and policy, the Branch has maintained public access to information about its activities. In practice, however, individuals seeking information are often left to their own devices for finding authoritative sources within the Branch. The difficulties inherent in this process are compounded by the attitudes and/or actions of the staff, who, lacking definitive guidance, training or responsibility for this area, are sometimes not sufficiently supportive or uninformed about information sources in the Branch.

38. The organization expends insufficient effort to determine what groups or individuals are interested or uninformed on matters related to the

Branch's operations and subsequently take steps to rectify this situation. Many groups and individuals are apt to challenge the Branch's actions while operating from an inadequate base of information. This often leads to wasting staff and Commission time as well as ill will or embarrassment on the part of the groups or individuals involved.

39. On some issues, the staff has adopted an adversary posture with respect to the positions of stakeholder groups. This sometimes leads to "win-lose" situations on specific issues. Few of the Branch's regulatory actions or other decisions can be reduced to such clear-cut alternatives when viewed in the context of larger environmental protection goals set for the Branch and its Commissions by the Legislature. These hard decisions are seldom cast in the more reasonable and tractable framework of broader goals and objectives. The adversary role carries with it the unfortunate tendency to reduce future opportunities for constructive stakeholder relations. No "win-lose" decision permanently excludes an individual or group from a legitimate place in the State's environmental programs but the Branch has thus far failed to develop a program for inviting an even-handed participation by all stakeholder groups in its continuing decision making and planning processes.

40. The branch does not systematically develop and maintain an integrated data base related to stakeholder groups. Information concerning stakeholder interests is maintained by particular individuals or components in the Branch. This situation prevents the Branch from performing periodic surveys to determine the beneficial or detrimental impacts of its programs on the wide spectrum of special interests in the State. Consequently, it becomes rather difficult to account to the Legislature, except on the basis of personal contact, for the present impacts of its programs on the various interest groups, and to make use of inputs from these interests to indicate possible legislative needs. Accountability to the Legislature in this manner is closely related to the requirement that the Branch be publicly accountable for its activities.

Stakeholder Processes Recommendations

Based upon the SRI project team's review of the Bureau's activities and stakeholder needs within the State, the following recommendations were developed to address the problems and opportunities encountered.

Establish within the intergovernmental component, a group whose specific responsibilities and duties are toward stakeholder interests for all of the Branch's programs.

The following responsibilities should be assigned to this group:

- Delegate to the group the responsibility for coordinating all presently required public participation activities for the Branch.
- Charge the group with the duty of developing and recommending additional requirements with respect to public participation in the Branch's activities based upon a continuing assessment of the need for such within the State.
- Assign to the group the responsibility for liaison with all stakeholder groups and the public, including development and dissemination of information on the Branch's present and proposed plans, programs, operations, and decisions.
- Require, by Departmental policy, coordination of the Branch's planning activities with the group in order to include a balanced and continuing assessment of stakeholder's interests in the development of the Branch's programs.
- Charge the group with the responsibility of developing, in cooperation with other elements in the Intergovernmental component, the socioeconomic impacts of the Branch's present and proposed programs. This includes not only the federally mandated land use related aspects of the Branch's air and water programs, but also State programs.

It is the SRI belief that this area of concern in the industrial and private citizens' sectors is one of the most vital considerations affecting governmental responsiveness and credibility at all levels of government. These issues must be addressed by all governmental bodies.